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May 1994

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# Index and Bulk Parameters for Frequency- Direction Spectra Measured at CERC Field Research Facility, September 1992 to August 1993

by Charles E. Long, Judy H. Roughton

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# **Index and Bulk Parameters for Frequency-Direction Spectra Measured at CERC Field Research Facility, September 1992 to August 1993**

by Charles E. Long, Judy H. Roughton  
U.S. Army Corps of Engineers  
Waterways Experiment Station  
3909 Halls Ferry Road  
Vicksburg, MS 39180-6199

Final report

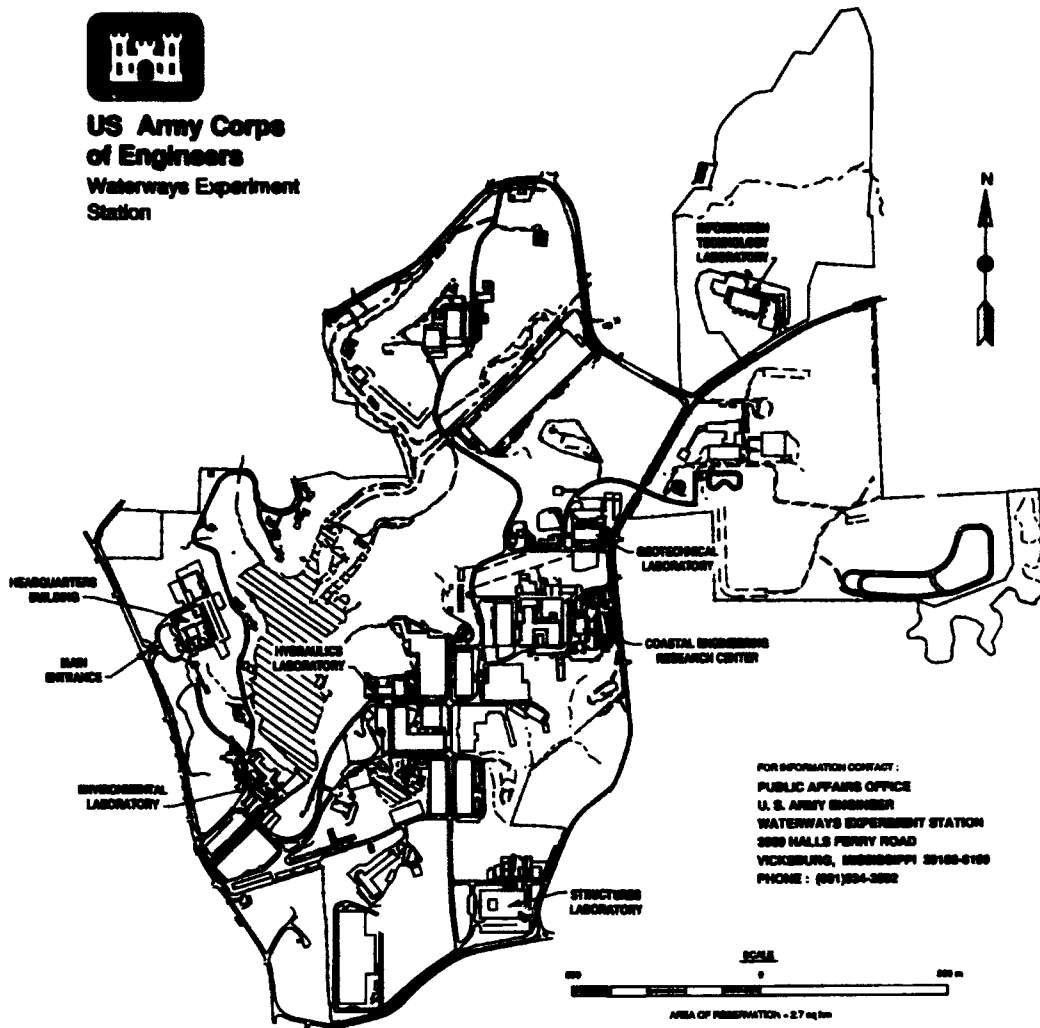
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# Preface

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This report indexes and describes means of access to a series of wind-wave frequency-direction spectral observations made with a special, high-resolution directional wave gauge. The work was motivated by a paucity of observations of directionally distributed wave energy, which has hindered understanding and modeling of the nearshore processes that affect coastal engineering projects. This effort was authorized by Headquarters, U.S. Army Corps of Engineers (HQUSACE), under Civil Works Coastal Flooding Program Research Work Unit 32484, "Directionality of Waves in Shallow Water." Funds were provided through the Coastal Engineering Research Center (CERC), U.S. Army Engineer Waterways Experiment Station (WES), under the program management of Ms. Carolyn M. Holmes, CERC. Messrs. John H. Lockhart, Jr., John G. Housley, Barry W. Holliday, and John F. C. Sanda were HQUSACE Technical Monitors.

This summary report was prepared by Dr. Charles E. Long using data processed and archived with help from Ms. Judy H. Roughton, a student contracted through the Cooperative Education Program at College of the Albemarle, Elizabeth City, NC, at CERC's Field Research Facility (FRF), Duck, NC. Work was performed under the direct supervision of Mr. William A. Birkemeier, Chief, FRF, and Mr. Thomas W. Richardson, Chief, Engineering Development Division, CERC; and under the general supervision of Dr. James R. Houston and Mr. Charles C. Calhoun, Jr., Director and Assistant Director, CERC, respectively.

The directional wave gauge and its data processing software were designed by Dr. Joan M. Oltman-Shay while at Oregon State University working through an Intergovernmental Personnel Agreement. This work would not be possible without continued physical maintenance of the directional wave gauge. This was done by the FRF dive team consisting of Messrs. Birkemeier, Michael W. Leffler, Brian L. Scarborough, C. Ray Townsend III, Eugene W. Bichner, and H. Carl Miller. Gauge calibration was maintained by Messrs. Kent K. Hathaway and Paul R. Hodges, FRF. Acquisition, monitoring, and storage of raw data were done by Mr. Clifford F. Baron, FRF.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander was COL Bruce K. Howard, EN.

# 1 Introduction

---

The range and magnitude of forces due to ocean waves in the so-called wind wave frequency band (roughly 0.04 to 0.3 Hz) are of importance to an engineer estimating the durability of a natural boundary or designing a modification to such a boundary. Wind waves are among the dominant forcing mechanisms in all coastal processes. Estimation of wave forces requires knowledge of the sea state in the region of interest. Description of a sea state requires, at a minimum, an amplitude, a frequency, and a direction for each component of the wave field. Historically, there have been many observations of wave amplitude and frequency, but very few detailed observations of wave direction, due primarily to additional technical requirements in making such measurements. This represents a distinct and very important void in the knowledge required for comprehensive engineering design.

In September 1986, to begin to alleviate this dearth of knowledge, the Field Research Facility (FRF) of the Coastal Engineering Research Center, U.S. Army Engineer Waterways Experiment Station, installed a high-resolution, directional wave gauge consisting of an alongshore linear array of nine pressure gauges for long-term observations of the nearshore incident directional wave climate at its site near Duck, NC (Figure 1). In September 1990, an additional six gauges with a cross-shore alignment were incorporated, making a fifteen-element, two-dimensional spatial array for estimating wave energy propagating in all directions.

Data thus obtained, which take the form of wave frequency-direction spectra, are intended for use by the broadest possible group of researchers and application engineers and have been archived in a simple form of database. This report simplifies data dissemination by indexing and describing means of access to the set of observations collected during the seventh year of deployment. Similar indexes for the first 6 years of deployment are reported by Long (1991a, 1991b), Long and Smith (1993, in preparation), Long and Atmadja (in preparation), and Long and Pemberton (in preparation).

The main text of this document describes and clarifies the substantial information contained in the appendixes. Brief overviews are given of the measurement site, instrumentation, data collection, and method of directional spectral estimation. These subjects are described in greater detail in other publications, to which the reader is referred. Following the overviews is a description of the archived frequency-direction spectra and some characteriz-

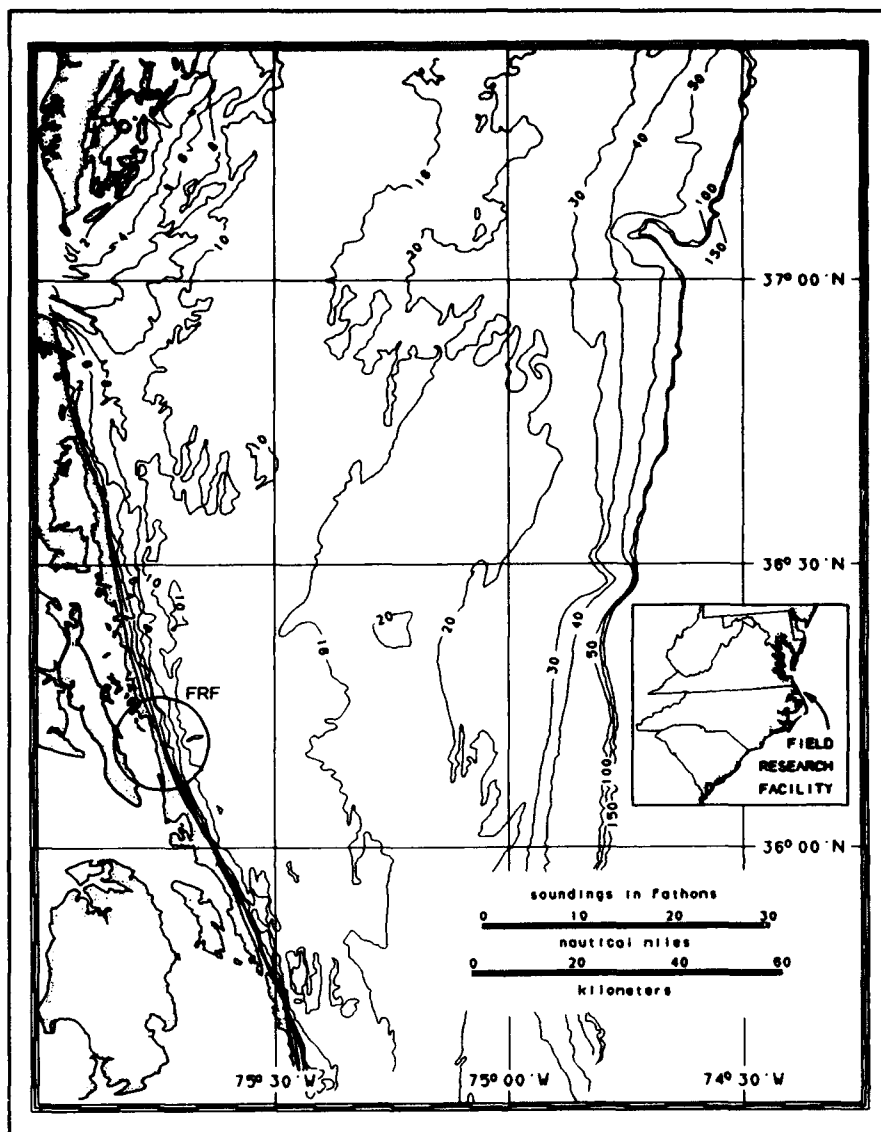


Figure 1. Location and offshore bathymetry of the FRF

ing bulk parameters that can be derived from them. Appendix A is a listing of these characterizing parameters and is intended to be used as a catalog of the set of spectra. Appendix B contains graphs of time series of some of these parameters as a pictorial augmentation of the information in Appendix A. Appendix C illustrates a FORTRAN computer program that can be used to read archived data, of which a sample listing is given in Appendix D.



## 2 Field Research Facility

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As shown in Figure 1, the FRF is located on the barrier island chain of coastal North Carolina. A detailed description of the layout, function, and capabilities of the FRF is given by Birkemeier et al. (1985). Of particular relevance to directional wave studies are the wave-steering bathymetry and wave-generating winds.

### Bathymetry

Regarding bathymetry, the coastline in the vicinity of the FRF is nearly straight for several tens of kilometers north and south (Figure 1). It is oriented such that a shore-normal line (directed seaward) is very nearly 70 deg from true north. Waves and onshore winds can approach this site along an easterly 180-deg arc from 340 to 160 deg true. The adjacent continental shelf is wide, relatively shallow, and of somewhat complex bathymetry. The direction of nearest approach of the 100-m isobath, which indicates the shelf break, is 10 to 15 deg south of east. On this azimuth, the shelf break is about 80 km distant. A typical bottom slope for the shelf is 1 m/km, but this is interrupted by numerous features of 1- to 10-km horizontal scales and 10-m vertical scales scattered irregularly across the shelf.

Within a few kilometers of the FRF, the offshore bathymetry is more regular, with isobaths nearly shore-parallel and a bottom slope of about 2 m/km (Figure 2). Some irregularities exist. Within about 300 m of the shore, there exists a complex and mobile bar system (Birkemeier 1984) that is strongly influenced by nearshore waves and currents. These processes have also created some irregular bathymetry in the vicinity of the 600-m-long FRF research pier (Miller, Birkemeier, and DeWall 1983).

### Wave-Generating Winds

The site is subject to a variety of climates, which gives rise to a diverse set of directional wave conditions. Primary sources of high-energy waves are winds associated with hurricanes and frontal passages. Though no hurricanes passed directly over the FRF during the period covered by this report, two (Danielle on 24 September 1992 and Emily on 31 August 1993) passed near enough that significant wave energy could be measured at the FRF. Unfortunately, the directional array of gauges was disabled for a major overhaul on

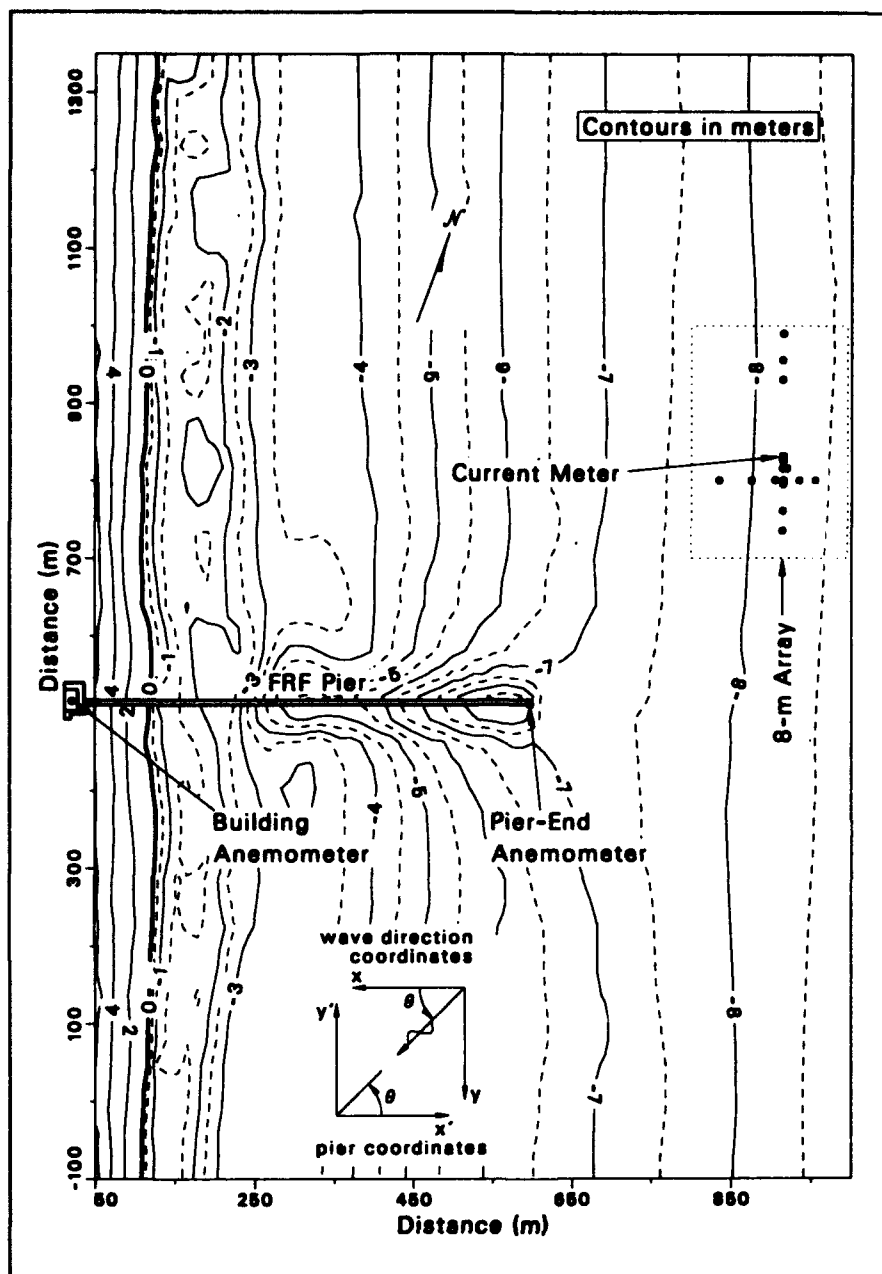


Figure 2. FRF nearshore bathymetry and coordinate system

12 August 1993, and so was not functioning during the passage of Hurricane Emily. Low-pressure weather fronts, of which several crossed the FRF site during this reporting year, were typically oriented northeast-southwest, with strong wave-generating winds coming from the northeast.

For additional information, the National Oceanic and Atmospheric Administration daily weather maps (U.S. Department of Commerce 1992, 1993)

contain large-scale depictions of weather systems passing the FRF site during this collection year. Detailed, quantitative descriptions of the climate at the FRF, as determined from its arsenal of instrumentation, are given in a series of annual reports, of which those by Leffler et al. (1991, 1992, 1993) are examples.

### 3 Instrumentation

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The primary instrument in this study is a high-resolution directional wave gauge. It consists of two parts. The first is a spatial array of sensors that sample sea-surface displacement at several points in (horizontal) space. The second, described in the following section on data processing, is the mathematical treatment of these data to obtain estimates of wave directionality.

The FRF array consists of 15 pressure gauges mounted approximately 0.5 m off the bottom in the vicinity of the 8-m isobath about 900 m offshore and to the north of the research pier (Figure 2). Its location satisfies three constraints. First, it is generally outside the surf zone so that linear wave theory is applicable in data processing. Second, it is in water shallow enough that signals from 3-sec waves, the shortest periods of interest here, are detectable above background noise at the bottom-mounted gauges. Third, it is located away from the irregular isobaths around the pier and in the nearshore bar system, which helps minimize bathymetrically induced inhomogeneities in the wave field.

Spacing between gauges in the array appears irregular in Figure 2 but, for the most part, corresponds to the array-design criterion posed by Davis and Regier (1977) that every gauge pair has a unique separation. Figure 3 is an enlarged view of the array layout and shows gauge spacing as well as the gauge naming scheme. A sixteenth pressure gauge (labelled T) in Figure 3 is part of a low-resolution directional wave gauge that also includes the current meter indicated in Figure 2. Gauge T is included in error checking procedures, and was available as a backup gauge in the event of failure of certain other gauges. Gauge T was used as part of the high-resolution array during part of this collection year, as discussed in Chapter 5.

The array geometry encompasses considerable ranges in both sizes and numbers of gauge separations. Minimum gauge spacing is 5 m in both the alongshore and cross-shore directions. Maximum spacing is 255 m in the alongshore direction and 120 m in the cross-shore direction. Intermediate gauge spacings are in multiples of 5 m. With 15 gauges, there are 105 possible unique spacings. In the FRF array, 12 redundant spacings are intentionally left for ancillary examination of spatial homogeneity of the wave field, so that 93 unique spacings remain.

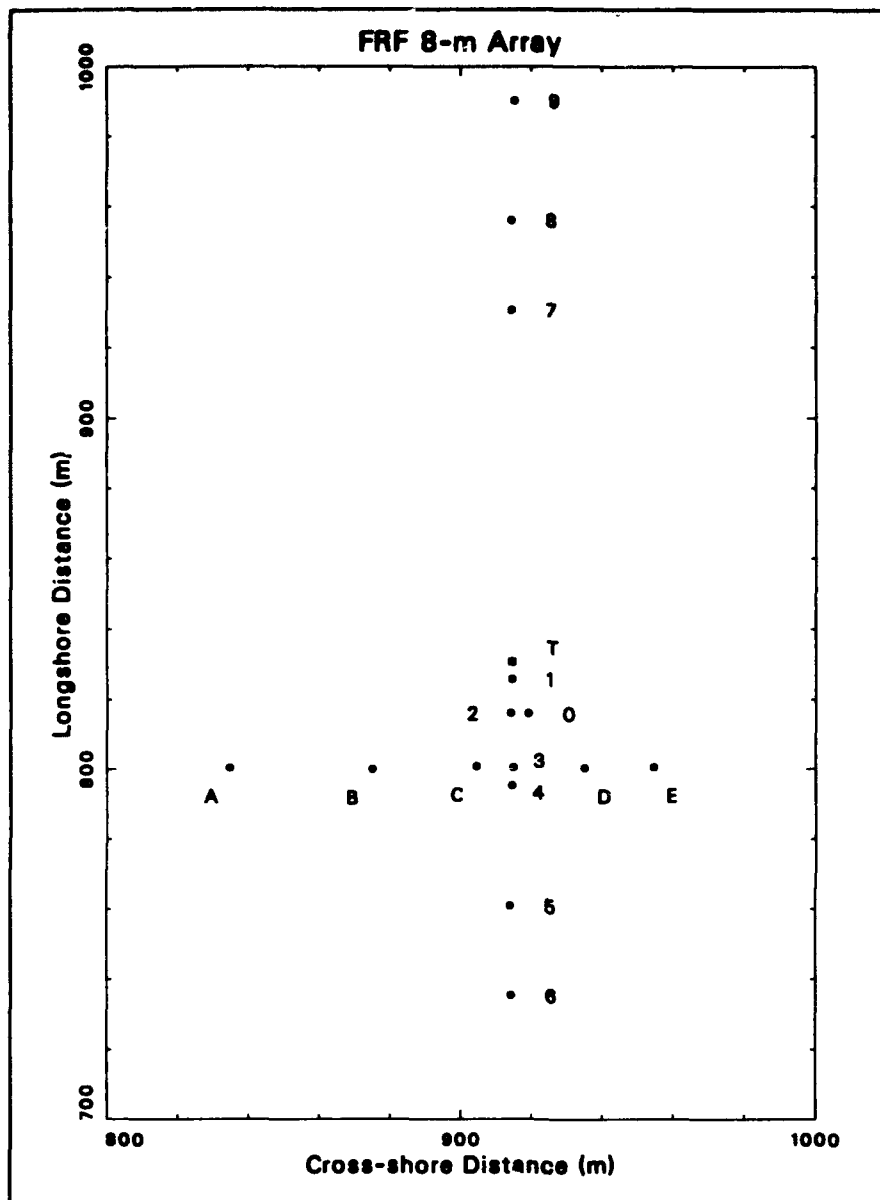


Figure 3. Spacing and numbering of linear array gauges

With the exception of gauge C, each pressure gauge is a Senso-Metric Model SP973(C), in which a piezo-electric strain gauge detects displacement of a pressure-sensitive diaphragm referenced to an evacuated cavity. Site calibrations indicate an accuracy of the pressure equivalent of  $\pm 0.006$  m of water for wave-induced fluctuations about a static water column height of 8 m. Gauge C is a Paroscientific Model 245AT resonating quartz absolute pressure transducer. The manufacturer's stated accuracy of this gauge is the pressure equivalent of  $\pm 0.003$  m of water, which is about twice as accurate as the Senso-Metric gauges.

Voltage analogs of pressure signals are hard-wired through 10-Hz, fourth-order, Butterworth filters (primarily to eliminate 60-Hz noise) to an analog-to-digital signal converter and then to a Digital Equipment Corporation VAX 11/750 computer for data acquisition. Discretization of the full-scale signal to 11-bit binary form results in a digitization step of the equivalent of 0.007 m of water, which is nearly the same as gauge accuracy.

## 4 Data Collection

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Signals from each of the pressure gauges were sampled at 2 Hz and stored digitally as records of 4,096 points (34 min 8 sec). A collection consisted of four such records, or 16,384 points (2 hr 16 min 32 sec) for each gauge. This procedure resulted in a total of 245,760 data points to produce one frequency-direction spectrum. Collections occurred eight times daily with starting times 0100, 0400, 0700, 1000, 1300, 1600, 1900 and 2200 hr Eastern Standard Time (EST). With this sampling pattern, the maximum possible number of collections is 2,920. Some collections are missed, however, because of necessary maintenance and repairs to the directional array and the data collection system.

During the period covered by this report, a total of 2,683 frequency-direction spectra (about 92 percent of the maximum possible) were obtained. A list of data collection start times for these observations is given in Appendix A. Appendix B contains time-series plots of spectral parameters with winds and currents as auxiliary environmental variables. Locations of reference anemometers and the current meter are shown in Figure 2. Note that wind vectors plotted in Appendix B are derived from the pier-end anemometer shown in Figure 2.

## 5 Data Processing

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Conversion of measured time series to estimates of frequency-direction spectra requires products of frequency spectral estimates from the gauges in the array. For final results to be accurate, raw input data must be of exceptionally high quality so that spiky or drifty data from one gauge do not contaminate products of results from the other gauges. Hence, the procedure for data processing is to check raw data for errors before estimating frequency-direction spectra. Some bulk parameters can then be computed to characterize results.

### Error Checking

Because multiple gauges were deployed in what was assumed to be a uniform sea, certain statistical properties of raw data from each of the set of gauges should be identical. One such property is the frequency spectrum  $S(f)$  (where  $f$  is frequency)<sup>1</sup> of raw (not surface-corrected) pressure signals. Under the ideal circumstances of constant water depth, uniform gauge elevation from the bottom, and no statistical noise, frequency spectra from all gauges are identical in every detail. Though these circumstances are not met exactly in the FRF system, they are approximated sufficiently closely that an intercomparison of the frequency spectra from the array of gauges is an excellent method for identifying erroneous data records.

A convenient way to effect such an intercomparison is to overplot frequency spectra from all the gauges on a single graph. Wind wave signals attenuate with depth so that, in accordance with linearized wave theory, very little direct wind wave energy is expected in the frequency range from about 0.4 Hz out to the sampling Nyquist frequency (1.0 Hz for normal FRF sampling). Spectra in this frequency band should primarily indicate system noise, which should be about the same for all gauges of like kind, and consistent in time for all gauges. Excessively spiky data from one gauge appears as an increased noise level relative to other gauges. Strong low-frequency drifts in data from one gauge appear either as deviations in the low-frequency part of the spectrum or as varying mean values from segment to segment through a data record. In the pass band of wind wave frequencies for which directional

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<sup>1</sup> For convenience, symbols and abbreviations are listed in the notation (Appendix E).

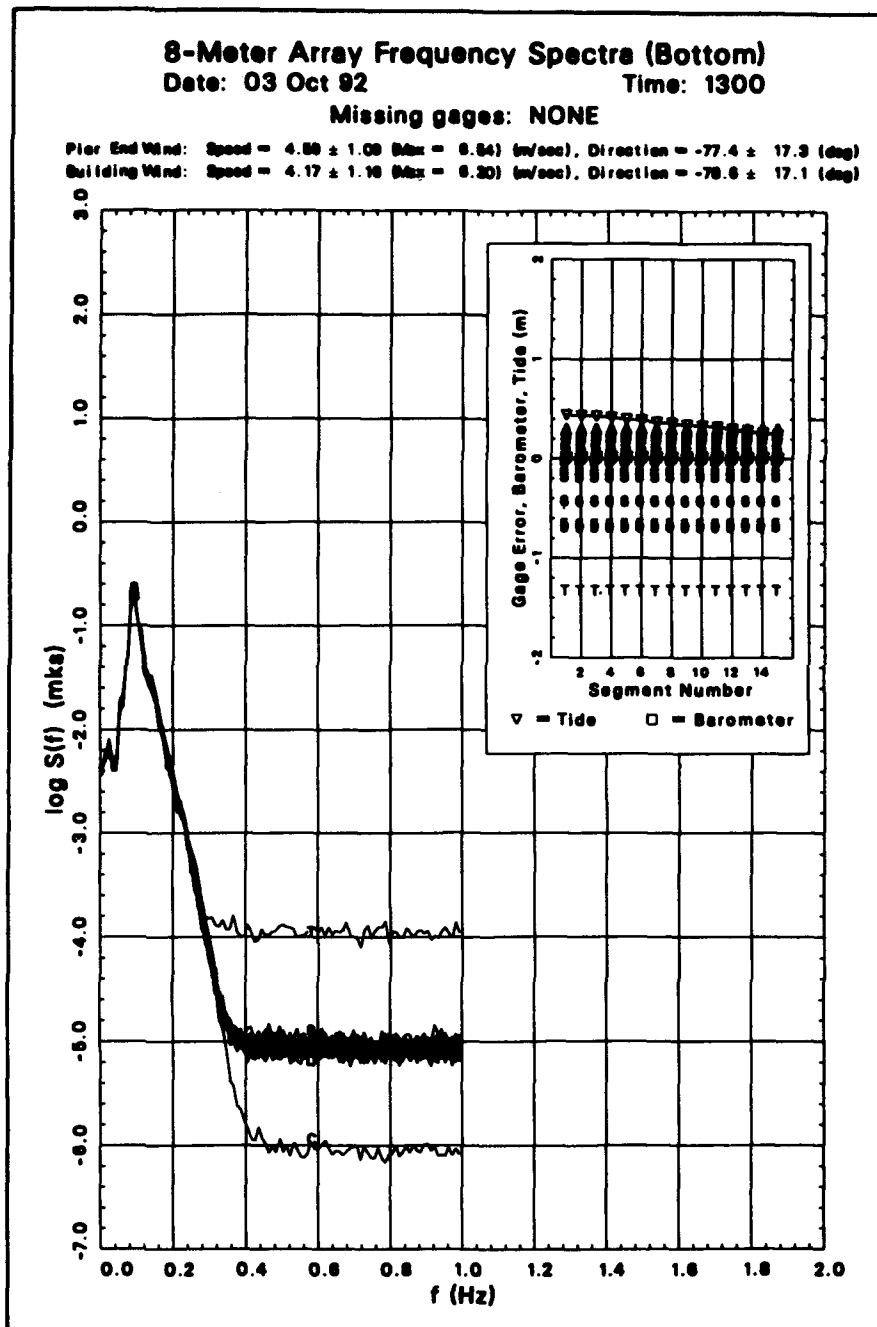


estimates are computed (0.04 to 0.32 Hz for these data), one expects the frequency spectra to be nearly identical. A malfunctioning gauge is clearly identifiable in this type of intercomparison.

Figure 4 is an example of one set of overplotted frequency spectra. Semi-logarithmic coordinates have been used to emphasize the behavior of the low-energy, high-frequency spectral tails. All pressure gauge signals have been converted to equivalent heights of a static water column for convenience in interpretation. As can be seen in Figure 4, spectra in the wind wave frequency pass band are very nearly alike, indicating that all gauges are functioning reasonably well. The noise floor at high frequencies is very low relative to the wind wave signal and is nearly uniform for all but two gauges. The two exceptions are the spare gauge (gauge T in Figure 3), for which the signal followed (at the time of the collection shown) a slightly different and intrinsically noisier electronic path to the data collection computer, and the Paroscientific gauge (gauge C in Figure 3), which had an inherently quieter background noise level than that of the other gauges. Note that when it became necessary to use data from gauge T in array processing, its signal path was reconfigured to have the same background noise levels as the main group of gauges.

The inset graph in Figure 4 reveals information about gauge mean values. Data records were divided into 15 half-overlapping segments having a duration of 17 min 4 sec. Segment mean values were then computed for each gauge. Ideally, when gauge means are corrected for the depth of water in which they were deployed and for the elevation of the gauge from the ocean bottom, they would all give a measure of mean water level (tidal elevation, barometric overpressure, and any wind- or wave-induced setup), which should be the same for all locations in the array for that segment of time. Experience has shown that the Senso-Metric gauges used in the 8-m array tend to have a modest mean drift over time scales of months. For the analysis used to produce this report, an estimate of true water depth was computed by finding the median of the set of corrected gauge means for each segment. The inset in Figure 4 shows the deviation of individual gauge means from this median value as a function of segment number, and indicates, for this example, mean depth errors ranging from about 1.3 m low to about 0.3 m high. By referencing all gauges to the median mean depth, potential errors in surface correcting the wind wave part of the signal are reduced.

The triangular symbol in the inset in Figure 4 shows the deviation of the median mean depth from still-water level (based on the 1929 National Geodetic Vertical Datum) as a function of segment number. The resulting curve represents the combined effects of tide, setup, and barometric overpressure. The square symbol in the inset in Figure 4 is the deviation of barometric pressure from one standard atmosphere in units of meters of sea water as a function of segment number. This curve indicates the magnitude of atmospheric pressure on pressure measurements of mean water level. This effect is removed from pressure gauge means by subtracting the excess of atmospheric pressure over one standard atmosphere from each of the gauge means.



It is noted that the present method of error checking is different from that used for results reported for the first four years of array analysis (Long 1991a, 1991b; Long and Smith 1993, in preparation). The older method relied on moments and extremal characteristics derived from data time series in the time domain. The present method casts the data in the frequency do-

main, but is sensitive to the same underlying characteristics that would flag data as suspect in the older method, and is much easier to use. In both methods, if a gauge demonstrated properties that deviated too much from properties of the other gauges, it was flagged as being suspect, and the data were then further examined by hand to ensure that the flagging procedure had indeed identified a malfunctioning gauge.

If a gauge malfunctioned, it was not used in further analysis. The analysis programs were written so that data from a subset of gauges could be analyzed. A few gauges could then be lost without seriously compromising the results. Using fewer gauges yields a somewhat reduced directional resolution. Some gauges are more critical than others. If any of the gauge pairs with 5-m spacings are lost, results become invalid at high frequencies due to aliasing. In these cases, directional analysis was truncated at a lower high-frequency limit (generally 0.24 Hz instead of the normal 0.32 Hz). As discussed in the next section, there are additional reasons for eliminating gauges from directional wave estimation at some frequencies in a spectrum. However, fewer than four gauges are never used for any frequency.

To keep track of the set of functioning and not otherwise eliminated gauges, a parameter called the *gauge pattern* was created and stored with the results for each frequency in archived directional spectra. The gauge pattern is a 16-place character string that represents which of the possible gauges (the fifteen 8-m array gauges plus the optional gauge T) were used to compute a directional spectrum at a particular frequency. The string contains the identifying characters (based on the gauge identification scheme shown in Figure 3) of gauges that were used in analysis followed by blank characters (if any) to fill out the string. This parameter can be of use in later analyses for assessing the directional resolving ability of a particular sub-array of gauges. This definition of gauge pattern differs from that used for the first 4 years of archived data, but the automated analysis algorithm was modified in September 1990 to be more dynamic in gauge selection (as described in the next section), and so necessitated this change.

## Frequency-Direction Spectra

### Two types of spectra

Data from the array of gauges are processed as two separate entities, both of which are frequency-direction spectra, but having different properties. One of the entities is a frequency-direction spectrum using only the original nine gauges (gauges 1, 2, 3, 4, 5, 6, 7, 8, and 9 in Figure 3) of the alongshore linear array. Directional spectra from this set of gauges are referred to as *linear array* results. The other entity is a frequency-direction spectrum using all gauges. Directional spectral estimates using all gauges are called *8-m array* or *full array* results.

There are several reasons for this distinction. One is that the database for the first 4 years of this study is based on results from the linear array. Comparisons of results over the full duration of the study and the accumulation of

climatological statistics require a continued analysis of the linear array as a unique entity. A shortcoming of the linear array is that it can not distinguish seaward-propagating waves from incident waves. In processing linear array data, it must be assumed that all wave energy is incident, which does not allow for the possibility of reflections from the nearshore. This problem is overcome by using the full array, which includes gauges at cross-shore locations (gauges O, A, B, C, D, and E in Figure 3) off the line of the linear array. The full array can detect wave energy propagating in all directions, and so can be used to estimate the amount of wave energy reflected (and otherwise propagating) from the nearshore.

Ideally, the full array would be adequate for all directional spectral estimates. However, the analysis algorithm for the full array is based on the assumption that waves are propagating through water of constant depth. In fact, the depth changes by about 0.8 m over the cross-shore breadth of the array (from gauge E to gauge A), or roughly 10 percent of the total depth. Intermediate- and shallow-water waves transform, largely by refraction, as they propagate through water of changing depth. This transformation introduces a slight shift in the phase difference between waves at two cross-shore locations relative to the phase difference of waves that are not transformed. Directional spectral estimates depend critically on accurate estimates of phase difference, and the effect of transforming waves, though slight, is to introduce an increased spread in the directional distribution of wave energy, especially for waves at high angles of attack. An optical analogy is a camera with a poorly ground lens that will focus clearly at the center but is slightly blurred at the edges.

The linear array does not have this blurring effect because waves have the proper phase difference as they cross a line of constant depth. Consequently, directional spectral estimates from the linear array are better resolved in their detailed structure. Because of this better resolution, linear array results are used for all characterizing parameters except reflection coefficients in this report. Though full array results are somewhat blurred, reflection coefficients are based on total energy in 180-deg arcs of direction, and so are less sensitive to a lack of detailed resolution than are other parameters like peak direction and directional spread. Note, however, that both linear array and full array spectra and associated parameters are computed, archived, and available through the mechanisms described in this report for all collections listed in Appendix A.

### **Spectral estimation**

Estimation of the frequency-direction spectrum is done in five parts. First, a working gauge set is identified. Second, time series of pressure data from each of the working gauges are Fourier transformed to the frequency domain. Third, these transforms are converted to sea-surface displacement transforms. Fourth, cross spectra of sea-surface displacement are computed between all unique gauge pairs for each frequency. Finally, an estimate is made of a directional distribution of wave energy that corresponds to the computed spatial variation in cross-spectral density for each frequency.

The choice of gauges to be used in a frequency-direction spectrum at a particular frequency depends on available gauges after error checking (described previously), the wavelengths of the waves to be resolved, and somewhat on the nature of the directional distribution of wave energy being estimated. Ocean wave signals at a given frequency tend to become uncorrelated over distances of a few wavelengths. Cross spectra of signals from two gauges of high-frequency (short wavelength) waves are reduced to noise if the gauge separation is too great. Conversely, cross spectra of signals from two closely spaced gauges do not yield a great deal of information about very long waves because the two signals are almost identical. Because of these characteristics of ocean waves, sub-arrays of both the linear and 8-m arrays are defined so that minimum gauge spacing and maximum array extent are tuned to ranges of wind wave frequencies, and directional spectra are estimated from the gauges in these sub-arrays.

An additional constraint on gauge usage is based on the observation by Davis and Regier (1977) that occasionally the directional spectrum is of sufficiently simple shape that some of the cross-spectral information becomes redundant, meaning that too many gauges (or, perhaps, gauges in less than ideal locations) have been employed in the directional estimate. An indication of this condition is that the matrix of cross-spectral estimates becomes singular in the mathematical sense. When this occurs in the course of a computation, the procedure is to eliminate a gauge from the sub-array being used, and restart the computation. To avoid eliminating a critical gauge, an order for gauge elimination was established that retained gauges known to be important. Because this procedure occurred in automated processing, a complete gauge elimination pattern was defined, but if fewer than four gauges remained at any point in processing, the entire analysis was aborted for that collection.

Another consideration for this collection year was that the aging power and signal cables connecting the gauges to the pier began to fail at an unusual rate. A major overhaul of the array had been planned for late summer 1993, but by early May, cabling for gauges 1, 2, 4, D, and E had failed, and the remaining gauges were less than ideal for spectral computation, especially at high frequencies. A temporary repair was made by physically moving gauges 8 and 9 to the locations of gauges 2 and 4, and including the backup gauge T in analysis (after rerouting its signal path to reduce its background noise to the levels of the other gauges). The net effect of the change was a loss of gauges 1, 8, 9, D, and E, and the addition of gauge T. The result was a modified, reasonably effective array of gauges that served from 8 May 1993 until 12 August 1993, when the whole array was disabled for overhaul.

Table 1 shows the wind wave frequency band sub-ranges, the sub-array of gauges to be used with each frequency sub-range, and the elimination order of gauges in each sub-array for the gauges of the linear array, both before and after modification. A column under a gauge number that contains an integer indicates a gauge to be used for the frequency range shown in the left column. The integers in each row indicate the order in which gauges are to be eliminated. For example, in the next-to-highest frequency range of the original array ( $0.14 < f \leq 0.19$  in the upper part of Table 1), gauges 1, 2, 3, 4, 5,

Table 1 Linear Array Gauge Usage										
Frequency Range (Hz)	Gauge									
	1	2	3	4	5	6	7	8	9	T
1 September 1992 to 8 May 1993										
$0.04 < f \leq 0.08$	5	1		7	4	6	8	2	3	
$0.08 < f \leq 0.14$	5	2	1	6	4	7	3			
$0.14 < f \leq 0.19$	5	6	1	4	3	2				
$0.19 < f \leq 0.32$	2	3	4	5	1					
8 May 1993 to 12 August 1993										
$0.04 < f \leq 0.08$		1		6	3	4	2			5
$0.08 < f \leq 0.14$		5		6	4	2	1			3
$0.14 < f \leq 0.19$		6	3	4	2	1				5
$0.19 < f \leq 0.32$		3	4	5	1					2

and 6 define the sub-array. In the event that a gauge must be eliminated, gauge 3 is eliminated first. If a second gauge must be eliminated, it is gauge 6, and so on, until the four-gauge limit is reached (if necessary). Table 2 shows the same type of information for the full array, including both pre- and post-modification array definitions.

Because gauge set definition varies with frequency (as well as date, in this collection year) and is somewhat data-adaptive in that some spectra require gauge elimination and others do not, it is important that a record be kept of the set of gauges used for each frequency in a collection analysis. That is the primary purpose of the gauge pattern parameter defined previously. The gauge pattern parameter is always kept with the archived results, and the limit of a minimum of four gauges for each directional estimate is never violated. Once the appropriate set of gauges has been identified, the subsequent analysis operations of Fourier transformation, surface correction, cross-spectral computation, and directional spectral estimation can proceed.

The Fourier transform is conventional. An 8,192-sec time series is divided into 15 half-overlapping segments of 1,024 sec. Segments are tapered with a Kaiser-Bessel window (a modified Bessel function of the first kind, compensated uniformly for loss of variance due to windowing) and fast Fourier transformed. An intermediate-resolution transform is found by averaging the 15 transformed segments, frequency by frequency. Final transforms are found by then averaging results over 10 adjacent frequency bands. Final resolution bandwidth is 0.00976 Hz, and degrees of freedom are at least 150 (assuming

Table 2 8-m Array Gauge Usage																
Frequency Range (Hz)	Gauge															
	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E	T
1 September 1992 to 8 May 1993																
$0.04 < f \leq 0.08$	1	11			12	8	6	5	2		9	10	7	4	3	
$0.08 < f \leq 0.12$	5	7			10	11	2	1			3	6	8	9	4	
$0.12 < f \leq 0.21$	7	10	11	6	3	1				8		4	9	5	2	
$0.21 < f \leq 0.32$	3	5	7	6						4			2	1		
8 May 1993 to 12 August 1993																
$0.04 < f \leq 0.08$		1	9		8	5	3				4	7	2			6
$0.08 < f \leq 0.14$		8	9		4	3	1				2	5	7			6
$0.14 < f \leq 0.19$		9	10	7	4	2				6	1	3	8			5
$0.19 < f \leq 0.32$		7	8	5	2					6		1	4			3

eight contiguous segments and ignoring any gain from lapped segments). Transform estimates are retained for 29 frequency bands with band-center frequencies ranging from 0.044 to 0.318 Hz.

Conversion of pressure signals at depth to water-surface displacement is done through the linearized wave theory pressure response factor as described in the *Shore Protection Manual* (1984). After this conversion, complex cross spectra in the form of coincident and quadrature spectra are computed in the conventional way (Bendat and Piersol 1971, Jenkins and Watts 1968) between all unique gauge pairs for each frequency.

Conversion of cross-spectral patterns in lag space to directional spectra is done with the Iterative Maximum Likelihood Estimation algorithm derived and described by Pawka (1982, 1983). The algorithm is also described in application to data from heave-pitch-roll buoys by Oltman-Shay and Guza (1984). Accuracy of directional estimates depends on frequency, with high-frequency waves (short wavelengths) being better resolved by an array of finite length. Tests with artificial data indicate that the FRF linear array generally can resolve the direction of a unidirectional wave train to within 5 deg and can distinguish two wave trains at the same frequency if their directions differ by at least 15 deg.

The algorithm used here employs discrete direction "bandwidths" or arcs of about 1.0 deg for all frequencies. Because this increment is finer than the resolution of any of the arrays, directional results were integrated over 2-deg

arcs and renormalized with this arc width to create evenly spaced directional spectra at all frequencies. Because linear array results are valid only in the 180-deg arc representing seaward approach directions, dividing this range into 2-deg arcs results in 91 arc center directions with which to characterize discretely the directional distribution of wave energy from the linear array. The full array can detect wave energy from all directions, so results are represented in 181 directional bins of 2-deg width (the terminal bins are redundant).

The primary result of data processing is an estimate of the discrete frequency-direction spectrum  $S(f_n, \theta_m)$ , which represents the variance of sea-surface displacement per frequency resolution bandwidth  $df$  ( $= 0.00976$  Hz) per direction resolution arc  $d\theta$  ( $= 2$  deg), where  $f_n$  is the  $n^{\text{th}}$  of  $N = 29$  discrete frequencies and  $\theta_m$  is the  $m^{\text{th}}$  of  $M = 91$  (for the linear array) or 181 (for the full array) discrete directions. In this work, direction is considered to be the angle from which wave energy is coming, measured counter-clockwise from shore-normal (Figure 2).

Numerical values of  $S(f_n, \theta_m)$  can range over many orders of magnitude, depending on the amount of energy in a given frequency band and direction arc, and this can require space-consuming formats for archiving data. To simplify this problem, frequency-direction spectra can be saved in the form of directional distribution functions  $D(f_n, \theta_m)$  defined by

$$D(f_n, \theta_m) = \frac{S(f_n, \theta_m)}{S(f_n)} \quad (1)$$

The directional distribution function has units of  $\text{deg}^{-1}$ , and its integral with respect to direction over all directions is unity.

The frequency spectrum in Equation 1 represents the sum over all directions of sea-surface variance per frequency bandwidth and is defined in terms of the frequency-direction spectrum by

$$S(f_n) = \sum_{m=1}^M S(f_n, \theta_m) d\theta \quad (2)$$

where the variables on the right-hand side are defined above. Note that this is identical to a conventional frequency spectrum that would result from a time series of sea-surface displacements at a single point in space. Because it is an integral of the frequency-direction spectrum, it is called the integrated frequency spectrum.

A directional analog of the frequency spectrum is the integrated direction spectrum, found by summing the frequency-direction spectrum over all frequencies for a fixed-direction arc. It is computed from



$$S(\theta_m) = \sum_{n=1}^N S(f_n, \theta_m) df \quad (3)$$

Figures 5 and 6 show ways to display frequency-direction spectra and the corresponding integrated frequency and integrated direction spectra from the two types of array analysis for the same collection time. Figure 5 displays results from the linear array, with some characterizing parameters shown in the figure header. Note that energy is displayed only for incident waves ( $-90 \text{ deg} < \theta < 90 \text{ deg}$ ). Figure 6 shows results from the full array. The characterizing parameters derived from this spectral estimate are nearly the same as those for the linear array results in Figure 5, showing that the two estimates are consistent in this regard, as expected. In Figure 6, directional energy estimates cover a complete circle. The small lumps near directions of  $-150 \text{ deg}$  and  $-180 \text{ deg}$  (or  $+180 \text{ deg}$ ) are indications of reflected energy.

## Bulk Parameters

Several parameters have been computed to characterize the observed spectra. There are five basic types of parameters: (a) characteristic wave height, (b) peak frequency (or its inverse, peak period), (c) peak direction, (d) directional spread, and (e) reflection coefficient. In this report, the first four of these parameters are computed from linear array results. The fifth is computed using results from the full array. Because there is more than one way to define some of these parameters, several alternate forms are presented here.

### Characteristic wave height

Characteristic wave heights from spectral observations are most frequently given as  $H_{mo}$ , which is four times the standard deviation of sea-surface displacement. It can be determined from the volume under the frequency-direction spectrum by the equation

$$H_{mo}^2 = 16 \sum_{n=1}^N \sum_{m=1}^M S(f_n, \theta_m) df d\theta \quad (4)$$

It can also be found from the integrated frequency spectrum by

$$H_{mo}^2 = 16 \sum_{n=1}^N S(f_n) df \quad (5)$$

which is its more conventional definition, or from the integrated direction spectrum (Equation 3) by

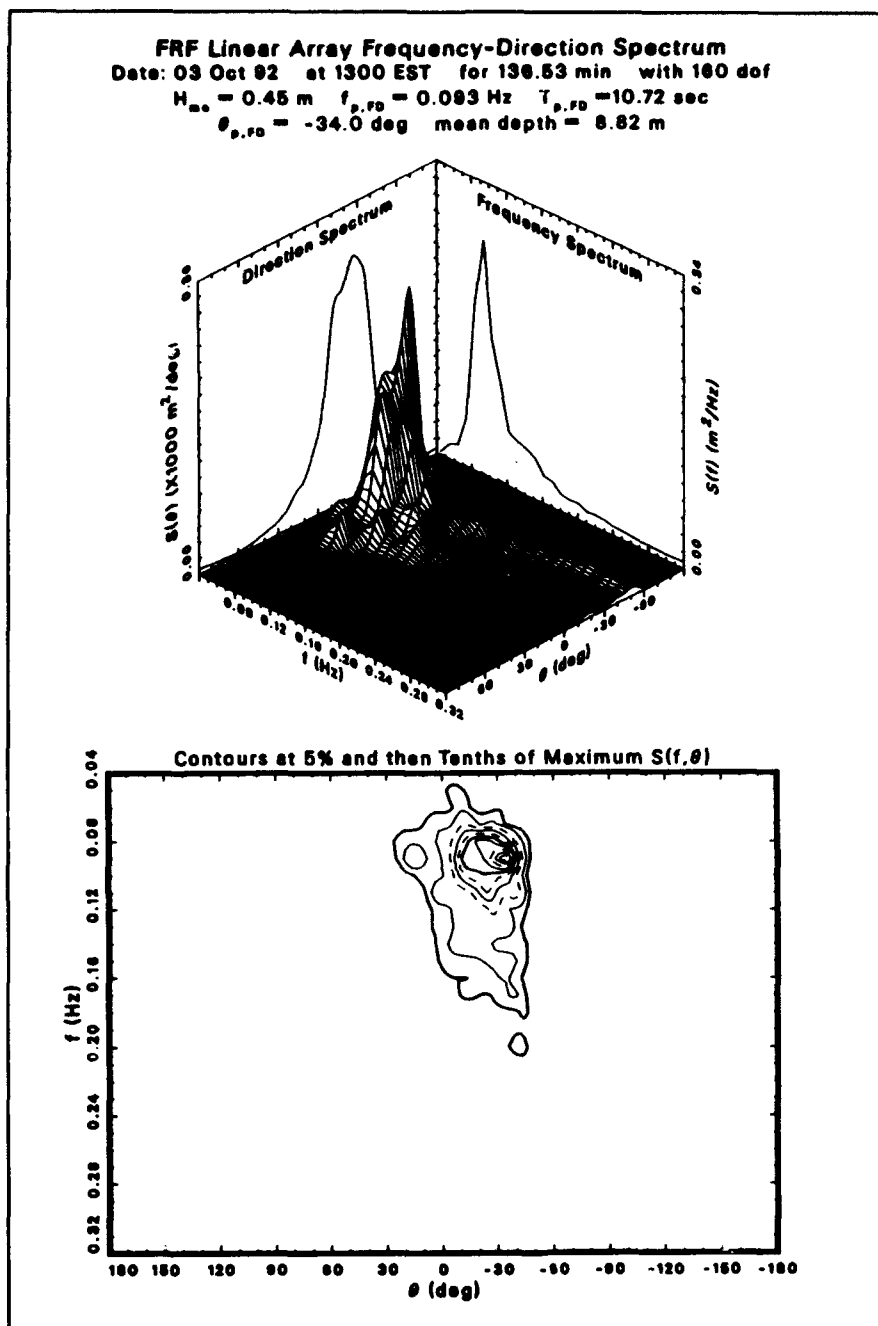


Figure 5. Example of a linear-array frequency-direction spectrum

$$H_{ms}^2 = 16 \sum_{m=1}^M S(\theta_m) d\theta \quad (6)$$

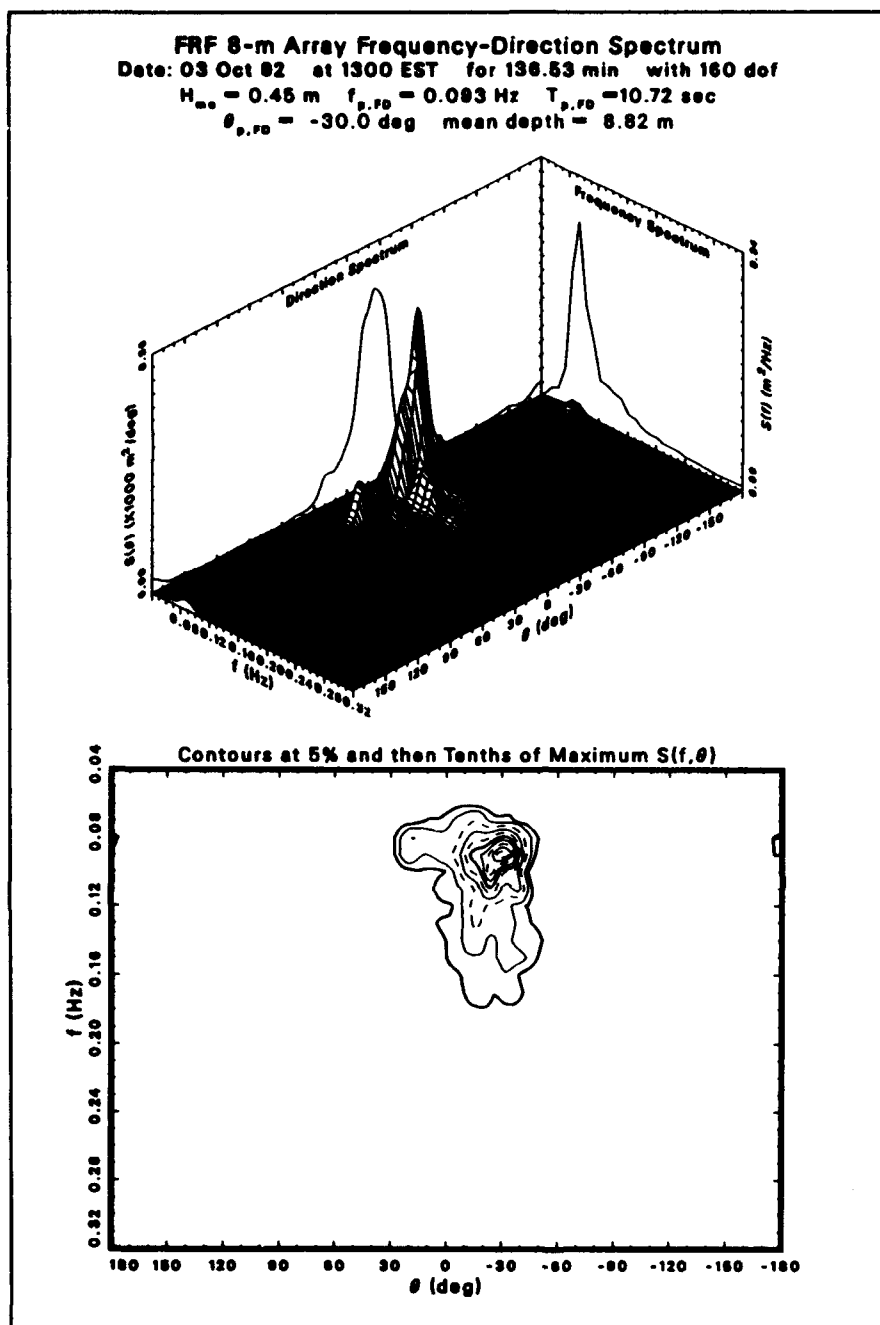


Figure 6. Example of a full-array frequency-direction spectrum

### Peak frequency

Peak frequency, which has the generic notation  $f_p$ , can be defined in at least two ways. One way is to find the frequency (and direction) at which the frequency-direction spectrum is maximum. This peak frequency is denoted

$f_{p,FD}$ . Another way is to find the frequency at which the integrated frequency spectrum is maximum. This is the more conventional definition, because of the plethora of measured frequency spectra, and it is denoted  $f_{p,IFS}$ . The two peak frequencies may not be the same. If the directional distribution is broad at the frequency for which the integrated frequency spectrum is maximum, it is possible that another frequency, at which the frequency-direction spectrum has a narrow directional distribution, will denote the maximum of the frequency-direction spectrum.

### Peak period

Peak period is the characteristic wave period associated with spectral peak frequency. Denoted generically by  $T_p$ , it is related to peak frequency by  $T_p = 1/f_p$ . Peak period from the frequency-direction spectrum is given by  $T_{p,FD} = 1/f_{p,FD}$ . Conventional peak period, derived from the integrated frequency spectrum, is given by  $T_{p,IFS} = 1/f_{p,IFS}$ .

### Peak direction

Peak direction is the direction representing the most energy. Given the generic symbol  $\theta_p$ , it, too, can be defined in several ways. One peak direction can be defined from the maximum of the frequency-direction spectrum. It is denoted by  $\theta_{p,FD}$ . Another peak direction can be associated with the maximum of the integrated direction spectrum, defined previously. This peak direction is denoted  $\theta_{p,IDS}$ . It can differ from  $\theta_{p,FD}$  if energy in the frequency-direction spectrum is centered at different directions for different frequencies. This condition tends to smear energy along the direction axis in the integrated direction spectrum, thereby shifting the peak relative to the peak of the frequency-direction spectrum. A third measure of peak direction is a weighted average peak direction defined by

$$\theta_{p,SW} = \frac{1}{\left(\frac{1}{4}H_{m0}\right)^2} \sum_{n=1}^N S(f_n) \theta_{p,n} \quad (7)$$

where

$\theta_{p,n}$  = peak direction of the directional distribution at the  $n^{\text{th}}$  frequency of the frequency-direction spectrum

$S(f_n)$  = integrated frequency spectrum from Equation 2

and  $H_{m0}$  is defined by Equation 4. This definition gives higher weights to the more energetic peak directions but does not rely on the single distribution with the most energy.

### Directional spread

A fourth type of characteristic parameter is directional spread. This parameter, denoted generically as  $\Delta\theta$ , gives a measure of the range of directions from which some significant fraction of energy is propagating. The basic definition used here is the arc subtended by the middle two quartiles of a directional distribution. As illustrated in Figure 7, the directional distribution function  $D(f_n, \theta_n)$  for a particular frequency  $f_n$  can be integrated from one bounding direction (here the shore-parallel direction at  $+90$  deg) to some arbitrary direction  $\theta_j$  to make a kind of cumulative distribution function  $I(f_n, \theta_j)$ . The formal definition is

$$I(f_n, \theta_j) = \sum_{m=1}^j D(f_n, \theta_m) d\theta \quad (8)$$

where  $j$  is the index of a discrete angle bin. The three quartile directions, called  $\theta_{25\%,n}$ ,  $\theta_{50\%,n}$ , and  $\theta_{75\%,n}$ , respectively, satisfy the equations

$$I(f_n, \theta_{25\%,n}) = 0.25 \quad (9)$$

$$I(f_n, \theta_{50\%,n}) = 0.50 \quad (10)$$

$$I(f_n, \theta_{75\%,n}) = 0.75 \quad (11)$$

A directional spread parameter for the  $n^{\text{th}}$  frequency is defined by

$$\Delta\theta_n = \theta_{25\%,n} - \theta_{75\%,n} \quad (12)$$

If Equation 12 is applied at the frequency where the frequency-direction spectrum is maximum, a measure of directional spread at the peak of the frequency-direction spectrum is obtained. This parameter is denoted  $\Delta\theta_{\text{PDP}}$ . If, instead of a directional distribution function at a single frequency, the normalized integrated direction spectrum is used in the set of Equations 8 to 12, a measure of bulk directional spread is obtained. This parameter is given the symbol  $\Delta\theta_{\text{IDS}}$ . A third measure of directional spread is found from a spectrally weighted average of the spreads at each frequency. Denoted as  $\Delta\theta_{\text{SW}}$ , this parameter is found from

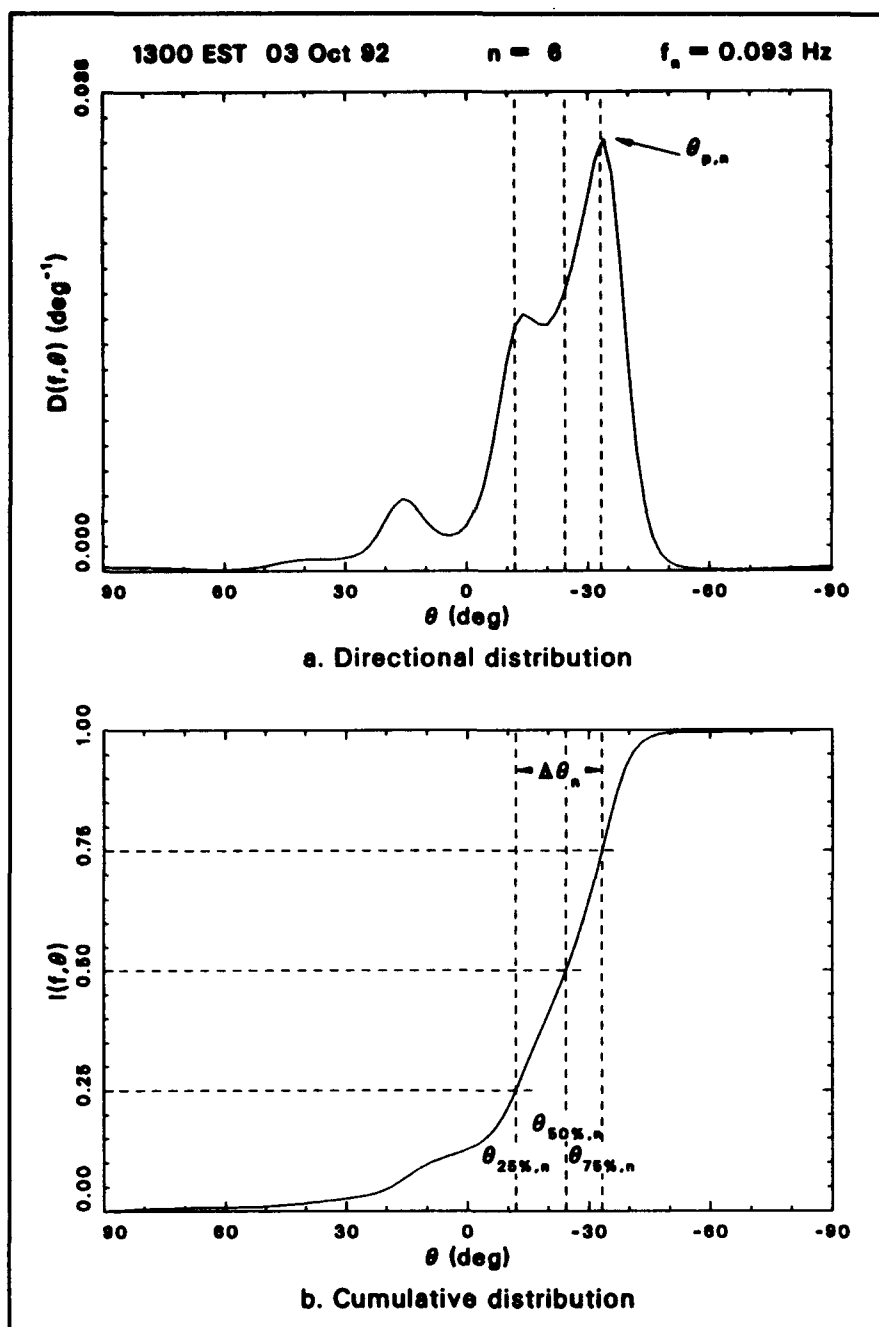


Figure 7. Directional spread computation

$$\Delta\theta_{sw} = \frac{1}{\left(\frac{1}{4}H_{m0}\right)^2} \sum_{n=1}^N S(f_n) \Delta\theta_n \quad (13)$$

Equation 13 is like Equation 7 for the spectrally weighted peak direction.

## Reflection coefficient

Following the definition in the *Shore Protection Manual* (1984), a reflection coefficient is a ratio of incident wave height to reflected wave height. This simple definition is based on the concept of unidirectional, monochromatic waves, which almost never occur in the real ocean. An adaptation of this definition for the purposes of this report is to use characteristic incident wave height  $H_{mo,i}$  and characteristic reflected wave height  $H_{mo,r}$  to define an energy-based reflection coefficient  $\chi$  as

$$\chi = \frac{H_{mo,r}}{H_{mo,i}} \quad (14)$$

Incident and reflected wave heights are defined in terms of incident and reflected energy. Squaring both sides of Equation 14 then yields an estimate of the ratio of total reflected to total incident wind wave energy, a characteristic that may be useful in consideration of nearshore dynamics.

Some care must be exercised both in defining and interpreting the characteristic wave heights and their ratio. Intrinsic in all spectral estimates is some level of background system and analysis noise that is not related to wave signals, is often unevenly distributed in direction, and is capable of severely degrading a ratio of entities like that in Equation 14. In a rough attempt to minimize the effects of background noise, a noise estimate is made by finding the minimum of the frequency-direction spectrum at each frequency  $S_{min}(f_n)$ , and computing incident energy  $E_i$  and reflected energy  $E_r$  relative to these minima. Using the full-array frequency-direction spectrum for these computations, the incident energy is

$$E_i = \rho g \sum_{n=1}^N \sum_{m=46}^{136} w_m [S(f_n, \theta_m) - S_{min}(f_n)] d\theta df \quad (15)$$

and the reflected energy is

$$E_r = \rho g \sum_{n=1}^N \sum_{m=1}^{46} w_m [S(f_n, \theta_m) - S_{min}(f_n)] d\theta df \\ + \rho g \sum_{n=1}^N \sum_{m=136}^M w_m [S(f_n, \theta_m) - S_{min}(f_n)] d\theta df \quad (16)$$

where all  $w_m = 1$ , except  $w_1 = w_{46} = w_{136} = w_M = \frac{1}{2}$ . The  $w_m$  are simply convenient notations that show the proper contributions of the spectrum to the end points of the sums in Equations 15 and 16, and do not otherwise affect the integrations. In terms of incident and reflected energies, the corresponding

characteristic wave heights are  $H_{mo,i} = 4\sqrt{E_i/\rho g}$  and  $H_{mo,r} = 4\sqrt{E_r/\rho g}$ , so that, on substitution into Equation 14, the reflection coefficient becomes

$$\chi = \sqrt{\frac{E_r}{E_i}} \quad (17)$$

The simple noise estimate used here does not eliminate the effects of noise in computing Equation 17 using Equations 15 and 16. This condition is evident in the tabular listings in Appendix A and the plotted results in Appendix B. There is a persistent background level of  $\chi \approx 0.1$ , which suggests that there is always about 1 percent of incident wave energy propagating back out to sea, a condition that is unlikely to be true. Synthetic data tests by Long and Oltman-Shay (1993) using the algorithms described in this report with a similar array of gauges indicate errors as large as 200 percent for  $\chi \approx 0.1$ , but with the error dropping rapidly for larger  $\chi$ . A reasonable way to interpret the results in this report is to consider  $\chi \geq 0.2$  as indicative of some reflection, and then to examine such spectra in detail for verification. In the spectrum shown in Figure 6, for example, the tabulated reflection coefficient is 0.27, and the figure does indeed indicate some reflection peaks.

#### Parameter summary

Together, the 12 parameters  $H_m$ ,  $f_{p,FD}$ ,  $f_{p,IFS}$ ,  $T_{p,FD}$ ,  $T_{p,IFS}$ ,  $\theta_{p,FD}$ ,  $\theta_{p,IFS}$ ,  $\theta_{p,SW}$ ,  $\Delta\theta_{IDS}$ ,  $\Delta\theta_{SW}$ ,  $\Delta\theta_{FDP}$ , and  $\chi$  give a bulk characterization of some properties of the frequency-direction spectra discussed in this report. There are, of course, many other parameters that can be defined, but the present set is simple and is easier to use than the 2,639 discrete spectral densities (29 frequencies  $\times$  91 directions) required for a full description of any linear array spectrum, or the 5,249 elements (29 frequencies  $\times$  181 directions) of any full-array spectrum discussed here.



## 6 Archived Results

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Optical disks containing the sets of observed linear-array and full-array frequency-direction spectra from this seventh year of data collection have been created to archive the observations. Appendix A contains a listing of the date, starting time, and the characterizing parameters defined previously for each case archived for the present year. It is intended to be used as a kind of index or catalog of the set of available cases. For reasons explained below, dates in Appendix A are given in the form *yymmdd* where *yy* is a two-digit year indicator (e.g., 92 means 1992), *mm* is the numeric index of the calendar month (i.e., 01 is January, 12 is December, etc.), and *dd* is day of the month. All times are Eastern Standard Time. A 24-hr clock is used.

Graphic representations of data collection times, some bulk parameters, and some auxiliary environmental variables are contained in Appendix B. One graph is shown for each month of the collection year. The upper part of each graph has time series plots of the bulk parameters  $H_m$ ,  $T_{p,FS}$ ,  $\theta_{p,ES}$ , and  $\Delta\theta_{ES}$  derived from the linear array, and  $\chi$  derived from the full array. The lower part of each graph has stick figure plots of three environmental variables. First is a kind of crude wave vector in which the stick vector has a length proportional to  $H_m$  and a direction given by  $\theta_{p,ES} + 180$  deg. The 180 deg is added to provide a physical frame of reference consistent with a vector pointing in the direction of energy propagation. Because peak wave energy is always directed onshore, all stick vectors in this part of the graph will have a component directed upward on the page.

The second stick figure plot is a wind vector as measured with one of the FRF anemometers, preferentially the pier-end anemometer with the building anemometer as a backup. Mounted at either end of the FRF pier (Figure 2) at elevations 19.5 m above mean sea level, these instruments give reasonable estimates of the wind climate in the vicinity of the 8-m array. Upgrades to the electronics of both anemometers during this collection year caused temporary problems where no wind data were collected. These times appear as gaps in the wind plots in Appendix B.

Because winds are very important in wave generation and modification, wind data from both of the anemometers indicated in Figure 2 are archived with spectral results. Both anemometers are of the impeller-vane type. Anemometer data are vector averaged and wind velocity variances are computed

both in and perpendicular to the mean wind direction. Archived with wave spectral results are mean wind speed, maximum wind speed, wind speed standard deviation, mean wind direction, and a measure of wind direction standard deviation (defined as the arc tangent of the ratio of cross-stream standard deviation of wind velocity to the mean wind speed).

The third stick figure plot is the current vector as measured with a current meter located on the line of the linear array, about 5 m northward of gauge 1 (Figure 2). Note that this current meter is in a different location from the one used in the first three directional spectral index reports (Long 1991a, 1991b; Long and Smith 1993). This instrument was approximately 2.4 m off the bottom in water about 8 m deep and, therefore, sensed currents near the bottom. All available current data are plotted. The current meter was subject to storm damage, biological fouling, and duration-related electronic problems, so that data are not available for all of the time covered by this report. Of existing data, the reader may note a significant anticorrelation between cross-shore winds and cross-shore currents. This is consistent with the behavior of wall-bounded, shallow-water, wind-generated currents. Additional details about the anemometers and current meter are given by Birkemeier et al. (1985).

## 7 Retrieving Processed Data

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The electro-optical medium containing the directional-spectral data archive is compact, but not very transportable. Consequently, a conversion program has been written to transform the data into a rather conventional, 80-column, formatted form that is much more easily distributed on common magnetic media. A user requesting some or all of the data will, by default, receive the data in formatted form. It may be possible to transfer the data in other ways, and specific requests can be coordinated with the FRF.

The data archive for the period covered by this report contains two sets of 2,683 files, one set for linear array results, and the other for full array results, with a file for each collection. When converted to formatted form, a linear array file has a length of about 30,000 bytes and a full array file is about twice this size, so the complete archive for the seventh collection year contains roughly 241 MB of information. A user may wish to consider whether this quantity of information will take too much system space before trying to copy the whole archive. Subsets of data can be created by reading the data archive one file at a time.

A formatted file is usually named *layymdddhmm.asc*, where *la* stands for linear-array frequency-direction spectrum, or *fdyymdddhmm.asc*, where *fd* means a full-array frequency-direction spectrum, and *asc* indicates that the files are in ASCII form. The character grouping *yymdd* represents the data collection date (as listed in Appendix A), and the character grouping *hmm* represents the data collection start time (also from Appendix A).

Once a file is on equipment and in a position to be read, it can be input to a computer program through any ASCII-formatted read statement. Appendix C contains a listing of a FORTRAN program that can read the formatted data files. The variables contained in a data file are listed in the header of the program in Appendix C. A listing of a sample data file of linear-array results is given in Appendix D. The read statements in the program in Appendix C can be visually aligned with the data fields of the listing in Appendix D if the user wishes to edit or visually read a data file. Program variable names, especially those that have parallel symbols in this text, are also listed in the Notation (Appendix E).

A user can obtain data by directing a request to:

Chief, Field Research Facility  
1261 Duck Road  
Kitty Hawk, NC 27949-4472  
Phone: (919) 261-3511  
Fax: (919) 261-4432

## 8 Summary of Results

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Data from the seventh collection year of high-resolution, directional-spectral observations at the FRF have been put in a form that is easily accessible to researchers interested in nearshore processes. Directional gauge array, directional analysis algorithms, and definitions of characterizing parameters are described in the body of this report, as are the location and form of archived data. Both a listing and a graphic presentation of data collection times and characteristic parameters are given in the appendixes. The appendixes also contain a sample data file and a listing of a FORTRAN program that can be used to read a data file.

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# Appendix A

## Table of Collection Times and Bulk Parameters

**Table A1**

**Collection Times and Bulk Parameters**

Date	Time EST	$H_{ms}$ m	$f_{p,0}$ Hz	$f_{p,10}$ Hz	$T_{p,0}$ sec	$T_{p,10}$ sec	$\theta_{p,0}$ deg	$\theta_{p,10}$ deg	$\theta_{p,20}$ deg	$\Delta\theta_{0-10}$ deg	$\Delta\theta_{10-20}$ deg	$\Delta\theta_{0-20}$ deg	$\sigma$
920901	0100	0.38	0.123	0.113	8.16	8.87	-32.0	-32.0	-36.0	15.8	14.4	13.0	0.17
920901	0400	0.36	0.113	0.113	8.87	8.87	-34.0	-32.0	-35.8	15.8	15.9	12.8	0.14
920901	0700	0.40	0.113	0.113	8.87	8.87	-40.0	-38.0	-22.3	36.1	27.0	16.6	0.23
920901	1000	0.80	0.230	0.230	4.35	4.35	58.0	58.0	35.2	46.8	30.6	29.1	0.13
920901	1300	0.66	0.220	0.220	4.54	4.54	58.0	56.0	32.5	53.2	37.4	34.3	0.12
920901	1600	0.58	0.220	0.230	4.54	4.35	54.0	56.0	22.9	65.9	38.2	38.4	0.11
920901	1900	0.52	0.113	0.230	8.87	4.35	-36.0	-36.0	15.5	73.7	38.7	35.1	0.16
920901	2200	0.52	0.113	0.240	8.87	4.17	-36.0	-40.0	9.4	71.7	37.0	29.5	0.16
920902	0100	0.50	0.113	0.113	8.87	8.87	-36.0	-36.0	0.6	65.6	34.3	19.7	0.14
920902	0400	0.51	0.113	0.113	8.87	8.87	-36.0	-36.0	-18.5	42.6	33.6	15.4	0.12
920902	0700	0.53	0.123	0.123	8.16	8.16	-38.0	-38.0	-19.9	37.2	31.6	18.9	0.17
920902	1000	0.54	0.123	0.123	8.16	8.16	-42.0	-42.0	-19.8	40.7	37.4	24.0	0.20
920902	1300	0.50	0.123	0.123	8.16	8.16	-38.0	-38.0	-20.3	36.6	33.2	26.6	0.16
920902	1600	0.48	0.123	0.123	8.16	8.16	-38.0	-36.0	-25.1	28.9	28.1	26.0	0.13
920902	1900	0.53	0.123	0.123	8.16	8.16	-8.0	-36.0	-33.9	30.2	27.0	25.6	0.16
920902	2200	0.57	0.269	0.269	3.72	3.72	-50.0	-38.0	-38.7	27.6	21.8	17.0	0.16
920903	0100	0.50	0.113	0.250	8.87	4.01	-32.0	-34.0	-38.6	29.0	22.7	21.5	0.15
920903	0400	0.52	0.123	0.230	8.16	4.35	-32.0	-34.0	-36.2	23.7	18.7	18.1	0.11
920903	0700	0.59	0.123	0.220	8.16	4.54	-30.0	-34.0	-36.5	20.9	19.0	16.5	0.13
920903	1000	0.64	0.220	0.220	4.54	4.54	-28.0	-36.0	-34.9	20.1	18.0	16.3	0.19
920903	1300	0.54	0.123	0.123	8.16	8.16	-30.0	-38.0	-34.7	22.9	19.6	10.2	0.18
920903	1600	0.59	0.308	0.123	3.25	8.16	-46.0	-40.0	-37.8	17.8	13.2	10.4	0.16
920903	1900	0.51	0.123	0.123	8.16	8.16	-34.0	-36.0	-37.6	20.8	16.5	9.4	0.12
920903	2200	0.49	0.132	0.210	7.56	4.75	-32.0	-38.0	-35.6	23.9	19.7	21.3	0.16
920904	0100	0.48	0.132	0.210	7.56	4.75	-38.0	-38.0	-38.7	25.3	22.1	24.8	0.16
920904	0400	0.45	0.132	0.220	7.56	4.54	-40.0	-40.0	-41.8	25.1	21.6	18.3	0.13
920904	1000	0.41	0.240	0.230	4.17	4.35	-48.0	-42.0	-39.2	25.9	22.1	18.8	0.20
920904	1300	0.43	0.269	0.240	3.72	4.17	-50.0	-40.0	-41.0	24.1	20.0	13.7	0.24
920904	1600	0.36	0.142	0.142	7.04	7.04	-40.0	-40.0	-37.1	24.6	21.7	15.3	0.21
920904	1900	0.35	0.132	0.123	7.56	8.16	-28.0	-28.0	-35.6	22.0	22.1	12.4	0.16
920904	2200	0.37	0.123	0.123	8.16	8.16	-36.0	-40.0	-38.3	25.3	22.8	13.4	0.21
920905	0100	0.36	0.142	0.083	7.04	11.98	-42.0	-44.0	-36.7	29.0	24.7	30.0	0.23
920905	0400	0.35	0.132	0.132	7.56	7.56	-32.0	-44.0	-36.6	29.7	26.6	9.6	0.22
920905	0700	0.35	0.132	0.132	7.56	7.56	-38.0	-30.0	-34.6	27.1	21.5	13.9	0.18
920905	1000	0.36	0.142	0.142	7.04	7.04	-42.0	-42.0	-32.1	26.2	22.6	14.0	0.25
920905	1300	0.36	0.142	0.142	7.04	7.04	-42.0	-44.0	-34.1	31.2	25.5	11.5	0.28

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{s,ms}$ Hz	$T_{s,ms}$ sec	$T_{s,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\lambda$
920905	1600	0.33	0.142	0.142	7.04	7.04	-42.0	-44.0	-35.7	33.3	26.4	18.5	0.29
920905	1900	0.35	0.152	0.093	6.59	10.72	-46.0	-22.0	-33.8	34.9	30.0	25.8	0.28
920905	2200	0.40	0.142	0.093	7.04	10.72	-44.0	-26.0	-15.6	54.1	29.4	29.0	0.26
920906	0100	0.52	0.259	0.093	3.86	10.72	24.0	28.0	5.8	52.3	35.3	25.8	0.20
920906	0400	1.04	0.152	0.152	6.59	6.59	16.0	16.0	17.7	19.6	20.0	10.7	0.14
920906	0700	1.11	0.142	0.142	7.04	7.04	16.0	16.0	18.2	22.3	21.6	17.8	0.12
920906	1000	1.09	0.142	0.142	7.04	7.04	14.0	12.0	14.6	25.1	22.9	19.4	0.12
920906	1300	1.08	0.152	0.142	6.59	7.04	16.0	16.0	15.2	26.4	22.2	24.6	0.17
920906	1600	1.00	0.152	0.142	6.59	7.04	14.0	16.0	14.8	28.3	24.2	25.6	0.17
920906	1900	0.91	0.152	0.152	6.59	6.59	16.0	16.0	15.6	30.4	25.1	18.8	0.13
920906	2200	0.91	0.162	0.152	6.19	6.59	18.0	16.0	9.4	32.0	26.0	21.9	0.12
920907	0100	0.88	0.162	0.152	6.19	6.59	14.0	12.0	14.9	33.3	27.3	18.7	0.15
920907	0400	0.83	0.162	0.123	6.19	8.16	16.0	14.0	14.3	34.3	28.9	30.9	0.16
920907	0700	0.80	0.123	0.123	8.16	8.16	6.0	18.0	9.1	36.0	30.6	34.0	0.13
920907	1000	0.90	0.113	0.113	8.87	8.87	2.0	14.0	9.6	30.6	28.9	28.9	0.13
920907	1300	0.98	0.113	0.113	8.87	8.87	4.0	10.0	10.3	30.6	29.5	27.3	0.16
920907	1600	0.98	0.103	0.093	9.71	10.72	0.0	4.0	5.6	29.7	28.6	24.3	0.16
920907	1900	0.94	0.093	0.093	10.72	10.72	-6.0	12.0	0.2	30.1	28.3	24.6	0.14
920907	2200	0.93	0.103	0.103	9.71	9.71	-12.0	12.0	-0.5	29.9	28.7	25.7	0.12
920908	0100	0.91	0.093	0.093	10.72	10.72	-12.0	12.0	3.5	30.7	29.4	23.5	0.14
920908	0400	0.87	0.093	0.093	10.72	10.72	-14.0	12.0	3.5	32.5	32.2	23.8	0.15
920908	0700	0.85	0.103	0.103	9.71	9.71	-16.0	10.0	-1.3	34.8	34.4	25.8	0.14
920908	1300	0.79	0.103	0.103	9.71	9.71	2.0	8.0	-0.7	34.2	35.5	23.2	0.15
920908	1600	0.76	0.093	0.103	10.72	9.71	-4.0	8.0	-4.2	37.5	37.8	26.8	0.18
920908	1900	0.74	0.123	0.113	8.16	8.87	-30.0	-32.0	-27.5	38.7	40.3	37.3	0.19
920908	2200	0.74	0.103	0.103	9.71	9.71	-6.0	10.0	-15.7	37.9	36.9	32.8	0.13
920909	0100	0.80	0.103	0.103	9.71	9.71	-16.0	-16.0	-20.7	34.5	34.1	27.7	0.15
920909	0400	0.78	0.103	0.103	9.71	9.71	-18.0	-20.0	-23.0	32.3	32.7	26.5	0.15
920909	0700	0.78	0.123	0.103	8.16	9.71	-24.0	-20.0	-21.1	34.4	34.2	31.4	0.15
920909	1000	0.73	0.132	0.113	7.56	8.87	-22.0	-20.0	-18.8	31.8	30.6	23.4	0.12
920909	1300	0.73	0.103	0.113	9.71	8.87	-16.0	-18.0	-25.2	31.3	30.2	29.4	0.13
920909	1600	0.67	0.132	0.103	7.56	9.71	-14.0	-14.0	-21.6	30.1	28.0	27.0	0.16
920909	1900	0.64	0.103	0.103	9.71	9.71	-16.0	-14.0	-27.4	33.3	28.9	25.5	0.17
920909	2200	0.66	0.103	0.103	9.71	9.71	-16.0	-16.0	-24.1	31.5	25.6	20.3	0.12
920910	0100	0.73	0.103	0.103	9.71	9.71	-20.0	-12.0	-23.8	35.5	25.9	27.3	0.14
920910	0400	0.69	0.113	0.103	8.87	9.71	-8.0	-8.0	-25.4	37.2	30.0	24.5	0.14
920910	0700	0.64	0.113	0.103	8.87	9.71	-20.0	-22.0	-34.0	39.1	33.0	22.6	0.14
920910	1000	0.70	0.103	0.103	9.71	9.71	-26.0	-32.0	-35.2	34.9	28.1	30.4	0.12
920910	1300	0.75	0.181	0.113	5.52	8.87	-42.0	-36.0	-35.1	31.6	26.0	27.1	0.13
920910	1600	0.77	0.123	0.103	8.16	9.71	-24.0	-28.0	-33.3	27.2	23.4	23.8	0.14
920910	1900	0.77	0.142	0.103	7.04	9.71	-36.0	-26.0	-36.2	29.0	23.9	25.7	0.14
920910	2200	0.81	0.132	0.132	7.56	7.56	-28.0	-28.0	-32.4	28.4	24.6	16.5	0.12
920911	0100	0.83	0.123	0.132	8.16	7.56	-26.0	-26.0	-36.1	30.1	26.4	26.6	0.12
920911	0400	0.84	0.142	0.142	7.04	7.04	-44.0	-42.0	-32.9	29.0	25.4	20.1	0.13
920911	0700	0.81	0.132	0.132	7.56	7.56	-32.0	-22.0	-22.3	40.1	33.3	25.9	0.16
920911	1300	1.17	0.191	0.210	5.24	4.75	44.0	54.0	26.9	57.9	24.5	16.7	0.13
920911	1600	1.23	0.201	0.201	4.98	4.98	46.0	58.0	29.6	49.5	24.6	19.0	0.19
920911	1900	1.23	0.230	0.201	4.35	4.98	54.0	54.0	34.2	38.9	22.9	19.9	0.19
920911	2200	1.27	0.171	0.171	5.83	5.83	28.0	34.0	30.3	34.2	22.7	14.5	0.15
920912	0100	1.25	0.181	0.181	5.52	5.52	32.0	34.0	29.7	31.1	24.0	15.8	0.13
920912	0400	1.29	0.171	0.171	5.83	5.83	28.0	38.0	32.0	29.2	23.0	16.2	0.14
920912	0700	1.27	0.171	0.171	5.83	5.83	40.0	40.0	35.0	27.5	21.6	20.2	0.18
920912	1000	1.22	0.171	0.171	5.83	5.83	36.0	38.0	34.9	29.1	20.3	16.5	0.16
920912	1300	1.20	0.171	0.162	5.83	6.19	24.0	24.0	27.6	30.0	21.2	15.1	0.16
920912	1600	1.12	0.171	0.162	5.83	6.19	22.0	22.0	29.6	32.3	25.3	16.4	0.13
920912	1900	1.09	0.171	0.162	5.83	6.19	30.0	32.0	27.3	31.6	26.7	22.9	0.13
920912	2200	1.04	0.162	0.162	6.19	6.19	36.0	38.0	24.2	34.1	26.3	20.7	0.13

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{AFO}$ Hz	$f_{AFB}$ Hz	$T_{AFO}$ sec	$T_{AFB}$ sec	$\theta_{AFO}$ deg	$\theta_{AFB}$ deg	$\theta_{AFV}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{mv}$ deg	$\Delta\theta_{mv}$ deg	$X$
920913	0100	1.09	0.142	0.142	7.04	7.04	16.0	32.0	24.1	36.4	28.6	19.5	0.10
920913	0400	1.30	0.142	0.201	7.04	4.98	12.0	18.0	19.0	29.3	25.4	19.7	0.10
920913	0700	1.39	0.201	0.201	4.98	4.98	24.0	18.0	24.0	32.6	29.0	21.5	0.12
920913	1000	1.33	0.191	0.181	5.24	5.52	16.0	16.0	21.1	33.4	28.9	25.0	0.10
920913	1300	1.22	0.181	0.191	5.52	5.24	4.0	8.0	14.4	34.9	29.5	25.9	0.10
920913	1600	1.07	0.113	0.113	8.87	8.87	-4.0	10.0	9.8	33.3	30.2	23.7	0.11
920913	1900	1.04	0.132	0.123	7.56	8.16	14.0	14.0	15.0	38.6	32.5	23.8	0.12
920913	2200	1.01	0.132	0.123	7.56	8.16	2.0	8.0	11.6	37.6	32.5	29.5	0.13
920914	0100	0.99	0.132	0.132	7.56	7.56	4.0	4.0	7.9	35.2	31.2	28.1	0.12
920914	0400	1.03	0.103	0.103	9.71	9.71	-16.0	6.0	2.8	37.9	34.9	26.8	0.11
920914	0700	0.99	0.123	0.113	8.16	8.87	-4.0	12.0	6.9	40.8	38.0	27.7	0.13
920914	1000	1.00	0.103	0.103	9.71	9.71	-14.0	-6.0	3.6	38.4	33.5	23.3	0.13
920914	1300	1.09	0.113	0.201	8.87	4.98	4.0	2.0	2.9	37.3	33.1	31.3	0.11
920914	1600	1.18	0.181	0.191	5.52	5.24	-2.0	0.0	-0.3	36.2	30.9	30.4	0.11
920914	1900	1.19	0.181	0.181	5.52	5.52	2.0	0.0	3.8	37.1	32.1	25.9	0.12
920914	2200	1.20	0.171	0.171	5.83	5.83	-2.0	0.0	9.6	36.1	30.8	19.9	0.11
920915	0100	1.23	0.171	0.113	5.83	8.87	-2.0	0.0	7.2	31.4	27.7	26.3	0.11
920915	0400	1.19	0.171	0.113	5.83	8.87	-2.0	-2.0	3.6	28.6	27.5	22.4	0.12
920915	0700	1.27	0.181	0.113	5.52	8.87	0.0	2.0	17.9	39.0	27.9	26.4	0.13
920915	1000	1.34	0.113	0.113	8.87	8.87	10.0	10.0	11.0	45.8	29.7	29.2	0.14
920915	1300	1.27	0.113	0.113	8.87	8.87	-10.0	4.0	13.7	42.2	32.0	26.0	0.12
920915	1600	1.27	0.123	0.123	8.16	8.16	-16.0	-10.0	-0.8	36.0	31.4	27.2	0.12
920915	1900	1.26	0.132	0.123	7.56	8.16	-28.0	-32.0	-0.8	41.0	34.3	29.6	0.14
920915	2200	1.15	0.123	0.132	8.16	7.56	-22.0	4.0	-6.2	44.2	36.8	33.3	0.13
920916	0100	0.95	0.132	0.123	7.56	8.16	-20.0	-10.0	6.8	39.4	33.4	26.8	0.13
920916	0400	0.93	0.103	0.103	9.71	9.71	-6.0	-4.0	7.8	38.9	36.1	23.0	0.15
920916	0700	0.91	0.123	0.123	8.16	8.16	6.0	8.0	10.1	40.0	35.9	27.2	0.15
920916	1000	0.81	0.103	0.103	9.71	9.71	-6.0	6.0	11.9	39.2	32.7	19.7	0.16
920916	1300	0.72	0.113	0.113	8.87	8.87	-8.0	-8.0	7.7	38.7	31.0	21.2	0.15
920916	1600	0.70	0.132	0.132	7.56	7.56	2.0	2.0	8.1	37.7	32.3	23.9	0.14
920916	1900	0.68	0.132	0.113	7.56	8.87	4.0	-32.0	-8.5	39.1	35.3	28.8	0.16
920916	2200	0.63	0.113	0.113	8.87	8.87	-12.0	-10.0	-9.5	35.0	33.4	22.0	0.18
920917	0100	0.57	0.113	0.113	8.87	8.87	-16.0	-28.0	-4.0	37.2	36.8	23.6	0.17
920917	0400	0.59	0.113	0.113	8.87	8.87	-16.0	-16.0	-10.0	35.6	36.1	22.5	0.14
920917	0700	0.61	0.103	0.113	9.71	8.87	-14.0	-14.0	-11.2	35.0	37.1	29.8	0.20
920917	1000	0.58	0.113	0.113	8.87	8.87	-12.0	-18.0	-21.7	34.5	37.1	26.2	0.19
920917	1300	0.55	0.113	0.113	8.87	8.87	-34.0	-18.0	-30.1	32.1	33.8	25.4	0.18
920917	1600	0.55	0.123	0.123	8.16	8.16	-20.0	-20.0	-26.7	29.9	29.1	23.1	0.13
920917	1900	0.54	0.113	0.113	8.87	8.87	-20.0	-18.0	-28.5	32.3	29.4	28.5	0.18
920917	2200	0.60	0.103	0.103	9.71	9.71	-18.0	-18.0	-25.6	27.2	24.6	17.1	0.17
920918	0100	0.60	0.103	0.103	9.71	9.71	-20.0	-20.0	-22.3	23.5	22.7	14.9	0.16
920918	0400	0.59	0.113	0.113	8.87	8.87	-18.0	-18.0	-18.9	23.5	22.1	18.3	0.12
920918	0700	0.59	0.123	0.113	8.16	8.87	-16.0	-16.0	-23.9	25.7	23.7	21.3	0.18
920918	1000	0.55	0.113	0.113	8.87	8.87	-16.0	-16.0	-24.3	28.3	24.3	18.4	0.20
920918	1300	0.59	0.113	0.113	8.87	8.87	-14.0	-16.0	-30.4	31.3	21.1	22.1	0.18
920918	1600	0.54	0.113	0.113	8.87	8.87	-18.0	-20.0	-31.4	30.9	19.1	23.8	0.15
920918	1900	0.50	0.113	0.123	8.87	8.16	-20.0	-20.0	-28.8	26.9	22.0	25.0	0.16
920918	2200	0.47	0.123	0.123	8.16	8.16	-24.0	-24.0	-31.6	27.9	22.0	19.2	0.20
920919	0100	0.46	0.123	0.123	8.16	8.16	-26.0	-36.0	-35.0	26.8	22.1	21.2	0.17
920919	0400	0.43	0.132	0.132	7.56	7.56	-20.0	-34.0	-33.6	25.3	20.0	16.9	0.12
920919	0700	0.40	0.123	0.113	8.16	8.87	-36.0	-34.0	-32.7	22.5	22.1	23.0	0.17
920919	1000	0.39	0.113	0.113	8.87	8.87	-28.0	-28.0	-36.2	24.0	22.7	18.3	0.22
920919	1300	0.38	0.123	0.113	8.16	8.87	-40.0	-40.0	-39.4	27.8	22.6	21.5	0.21
920919	1600	0.35	0.123	0.123	8.16	8.16	-34.0	-36.0	-26.0	30.1	37.6	17.5	0.20
920920	1000	0.90	0.210	0.210	4.75	4.75	42.0	42.0	26.8	35.9	29.6	19.6	0.11
920920	1300	1.05	0.191	0.191	5.24	5.24	38.0	40.0	28.2	35.9	31.7	18.2	0.10
920920	1600	1.21	0.191	0.181	5.24	5.52	34.0	32.0	19.4	36.0	33.4	23.1	0.09
920920	1900	1.18	0.171	0.171	5.83	5.83	22.0	22.0	12.6	29.8	30.8	17.0	0.09

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{A/B}$ Hz	$f_{A/B}$ Hz	$T_{A/B}$ sec	$T_{A/B}$ sec	$\theta_{A/B}$ deg	$\theta_{A/B}$ deg	$\theta_{A/B}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\chi$
920920	2200	1.06	0.181	0.171	5.52	5.83	22.0	22.0	14.1	26.5	28.6	17.4	0.10
920921	0100	0.95	0.181	0.181	5.52	5.52	20.0	18.0	23.1	27.6	28.1	15.0	0.11
920921	0400	0.82	0.181	0.181	5.52	5.52	16.0	20.0	18.8	30.7	27.1	14.5	0.13
920921	0700	0.74	0.191	0.191	5.24	5.24	30.0	16.0	17.1	43.4	24.7	15.3	0.15
920921	1000	0.74	0.191	0.191	5.24	5.24	16.0	16.0	6.3	51.1	36.5	12.9	0.16
920921	1300	0.78	0.181	0.191	5.52	5.24	20.0	16.0	12.4	60.0	55.5	39.4	0.16
920921	1900	0.71	0.181	0.181	5.52	5.52	20.0	18.0	3.5	59.6	57.3	53.1	0.14
920922	0100	0.73	0.181	0.181	5.52	5.52	20.0	-42.0	-9.2	59.1	55.8	49.3	0.16
920922	0400	0.73	0.181	0.181	5.52	5.52	26.0	-44.0	-6.9	56.2	52.1	65.6	0.16
920922	0700	0.76	0.152	0.181	6.59	5.52	-50.0	-32.0	-32.2	44.1	46.0	64.2	0.14
920922	1000	0.81	0.171	0.181	5.83	5.52	-52.0	-42.0	-44.2	35.2	32.4	32.4	0.13
920922	1300	0.80	0.142	0.191	7.04	5.24	-42.0	-40.0	-43.7	33.5	31.7	44.0	0.16
920922	1600	0.78	0.142	0.142	7.04	7.04	-46.0	-46.0	-45.4	27.2	27.0	9.0	0.15
920922	1900	0.73	0.142	0.113	7.04	8.87	-44.0	-44.0	-42.1	31.1	27.6	19.3	0.13
920922	2200	0.75	0.142	0.123	7.04	8.16	-42.0	-42.0	-41.2	28.5	25.9	22.7	0.13
920923	0100	0.82	0.113	0.113	8.87	8.87	-32.0	-42.0	-42.3	28.5	27.4	18.7	0.14
920923	0700	1.76	0.191	0.181	5.24	5.52	44.0	44.0	35.1	26.4	21.1	13.4	0.15
920923	1000	2.41	0.152	0.152	6.59	6.59	40.0	38.0	34.4	23.6	22.1	17.9	0.17
920923	1300	2.70	0.132	0.132	7.56	7.56	24.0	22.0	32.2	27.4	25.2	22.0	0.19
920923	1600	2.63	0.132	0.132	7.56	7.56	36.0	38.0	36.0	26.3	23.9	22.9	0.21
920923	1900	2.67	0.142	0.123	7.04	8.16	22.0	20.0	28.8	29.2	26.3	27.7	0.18
920923	2200	2.55	0.132	0.123	7.56	8.16	22.0	22.0	28.0	29.1	25.7	23.7	0.17
920924	0100	2.48	0.132	0.132	7.56	7.56	10.0	14.0	20.5	28.4	32.3	19.7	0.11
920924	0400	2.70	0.123	0.123	8.16	8.16	10.0	14.0	21.3	28.3	31.4	20.6	0.12
920924	0700	2.98	0.113	0.113	8.87	8.87	10.0	10.0	13.4	25.1	30.9	13.3	0.11
920924	1000	3.18	0.103	0.103	9.71	9.71	4.0	8.0	8.8	24.4	28.6	16.6	0.12
920924	1300	3.40	0.103	0.103	9.71	9.71	14.0	2.0	9.1	25.8	31.7	17.3	0.13
920924	1600	3.62	0.093	0.093	10.72	10.72	10.0	8.0	8.0	26.6	31.4	15.1	0.16
920924	1900	3.56	0.093	0.093	10.72	10.72	10.0	6.0	10.8	29.1	32.6	17.7	0.13
920924	2200	3.48	0.093	0.093	10.72	10.72	-2.0	10.0	5.5	24.3	28.7	18.8	0.12
920925	0100	3.63	0.093	0.093	10.72	10.72	8.0	6.0	5.9	25.3	29.5	16.5	0.11
920925	0400	3.85	0.093	0.093	10.72	10.72	6.0	6.0	10.0	25.1	29.9	13.6	0.12
920925	0700	3.75	0.103	0.103	9.71	9.71	-30.0	12.0	4.4	36.9	37.9	45.8	0.12
920925	1000	3.05	0.093	0.113	10.72	8.87	8.0	10.0	12.9	32.0	33.7	38.2	0.11
920925	1300	2.14	0.083	0.083	11.98	11.98	0.0	2.0	18.0	30.2	31.0	13.0	0.12
920925	1600	1.60	0.093	0.093	10.72	10.72	-2.0	0.0	17.8	32.0	34.4	18.1	0.17
920925	1900	1.39	0.103	0.093	9.71	10.72	12.0	12.0	12.5	27.5	32.7	19.5	0.18
920925	2200	1.36	0.093	0.093	10.72	10.72	4.0	0.0	-1.4	23.2	26.8	15.3	0.14
920926	0100	1.39	0.103	0.103	9.71	9.71	0.0	2.0	-2.3	31.1	31.2	23.6	0.17
920926	0400	1.35	0.103	0.103	9.71	9.71	2.0	4.0	-3.5	30.4	32.2	22.2	0.20
920926	0700	1.21	0.103	0.103	9.71	9.71	2.0	10.0	-5.4	32.9	35.5	26.4	0.22
920926	1000	1.16	0.103	0.083	9.71	11.98	-2.0	8.0	0.4	30.0	31.3	28.2	0.19
920926	1300	1.13	0.093	0.093	10.72	10.72	-4.0	2.0	2.4	29.7	31.7	23.9	0.17
920926	1600	1.11	0.103	0.103	9.71	9.71	-2.0	0.0	-7.0	30.6	31.1	26.0	0.19
920926	1900	1.08	0.093	0.093	10.72	10.72	0.0	2.0	-4.4	33.7	34.9	22.0	0.20
920926	2200	0.99	0.103	0.093	9.71	10.72	0.0	0.0	-1.2	34.3	34.3	26.2	0.18
920927	0100	1.03	0.093	0.093	10.72	10.72	-14.0	8.0	-2.1	32.5	32.6	23.0	0.15
920927	0400	0.99	0.093	0.093	10.72	10.72	-6.0	12.0	4.0	35.2	36.5	24.9	0.18
920927	0700	0.98	0.093	0.093	10.72	10.72	-14.0	-12.0	-1.1	34.5	35.9	22.7	0.21
920927	1000	0.92	0.093	0.093	10.72	10.72	-18.0	-4.0	-9.9	34.7	37.3	25.4	0.20
920927	1300	0.89	0.093	0.093	10.72	10.72	8.0	4.0	-9.8	35.5	36.4	28.3	0.15
920927	1600	0.93	0.093	0.093	10.72	10.72	-14.0	6.0	-5.1	35.3	35.1	25.9	0.18
920927	1900	0.94	0.093	0.093	10.72	10.72	-18.0	-18.0	-18.1	37.5	37.4	23.6	0.18
920927	2200	0.93	0.093	0.093	10.72	10.72	-22.0	-20.0	-16.0	39.2	39.3	27.1	0.16
920928	0100	0.97	0.113	0.103	8.87	9.71	-38.0	-38.0	-27.3	36.5	34.9	26.5	0.13
920928	0400	1.01	0.113	0.113	8.87	8.87	-40.0	-40.0	-32.4	36.2	36.3	31.8	0.14
920928	0700	1.10	0.113	0.113	8.87	8.87	-38.0	-40.0	-38.0	36.1	36.4	31.8	0.16

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{APD}$ Hz	$f_{APD}$ Hz	$T_{APD}$ sec	$T_{APD}$ sec	$\theta_{APD}$ deg	$\theta_{APD}$ deg	$\theta_{APD}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\lambda$
920928	1300	0.98	0.103	0.103	9.71	9.71	-24.0	-36.0	-30.4	31.7	31.2	26.3	0.13
920928	1600	1.01	0.113	0.113	8.87	8.87	-38.0	-38.0	-31.4	34.5	32.3	25.6	0.15
920928	1900	1.10	0.113	0.113	8.87	8.87	-42.0	-42.0	-32.5	40.8	36.9	34.1	0.15
920928	2200	1.11	0.123	0.113	8.16	8.87	-40.0	-42.0	-2.8	47.8	52.2	34.3	0.16
920929	0100	1.21	0.230	0.103	4.35	9.71	58.0	60.0	10.4	77.0	29.0	31.5	0.15
920929	0400	1.77	0.171	0.181	5.83	5.52	42.0	52.0	35.6	28.9	19.9	16.0	0.18
920929	0700	1.84	0.171	0.171	5.83	5.83	42.0	42.0	32.1	32.6	22.0	13.4	0.20
920929	1000	1.84	0.171	0.171	5.83	5.83	42.0	52.0	35.2	32.2	20.5	14.8	0.20
920929	1300	1.69	0.152	0.162	6.59	6.19	22.0	50.0	28.3	34.8	22.3	18.0	0.19
920929	1600	1.64	0.162	0.162	6.19	6.19	24.0	42.0	28.9	36.1	21.5	18.0	0.19
920929	1900	1.73	0.162	0.162	6.19	6.19	24.0	44.0	29.8	31.5	20.8	17.3	0.18
920929	2200	1.73	0.171	0.152	5.83	6.59	40.0	38.0	28.4	36.8	23.9	27.8	0.18
920930	0100	1.79	0.152	0.152	6.59	6.59	22.0	34.0	25.1	31.3	23.1	16.2	0.15
920930	0400	1.81	0.152	0.152	6.59	6.59	22.0	24.0	24.8	31.2	23.2	14.7	0.15
920930	0700	1.90	0.152	0.152	6.59	6.59	18.0	38.0	22.4	35.0	25.4	21.2	0.17
920930	1000	1.81	0.152	0.142	6.59	7.04	18.0	36.0	28.3	35.9	23.4	23.6	0.18
920930	1300	1.60	0.152	0.142	6.59	7.04	34.0	36.0	27.7	34.4	22.9	27.9	0.18
920930	1600	1.36	0.162	0.162	6.19	6.19	20.0	20.0	22.6	38.2	22.1	16.2	0.18
920930	1900	1.46	0.171	0.171	5.83	5.83	20.0	52.0	28.1	39.5	23.8	19.4	0.20
920930	2200	1.48	0.191	0.181	5.24	5.52	36.0	40.0	27.5	35.6	22.4	22.2	0.17
921001	0100	1.68	0.152	0.152	6.59	6.59	20.0	20.0	28.9	30.9	21.7	16.0	0.17
921001	0400	1.72	0.152	0.142	6.59	7.04	22.0	22.0	27.3	30.7	23.4	19.1	0.16
921001	0700	1.51	0.152	0.152	6.59	6.59	20.0	40.0	28.7	30.7	22.7	18.0	0.15
921001	1000	1.56	0.162	0.162	6.19	6.19	20.0	36.0	31.2	29.9	22.3	20.4	0.17
921001	1300	1.48	0.142	0.142	7.04	7.04	20.0	20.0	25.4	27.2	21.2	16.6	0.16
921001	1600	1.24	0.142	0.142	7.04	7.04	16.0	20.0	21.2	27.1	23.2	18.7	0.14
921001	1900	1.12	0.142	0.142	7.04	7.04	20.0	16.0	18.5	28.1	24.1	16.4	0.15
921001	2200	0.97	0.162	0.152	6.19	6.59	16.0	16.0	19.3	31.3	25.9	20.5	0.16
921002	0100	0.83	0.093	0.093	10.72	10.72	-18.0	12.0	15.6	36.3	26.1	20.6	0.17
921002	0400	0.80	0.093	0.093	10.72	10.72	-18.0	12.0	10.5	36.6	23.9	18.1	0.17
921002	0700	0.76	0.083	0.083	11.98	11.98	-18.0	10.0	7.0	35.2	24.3	23.9	0.20
921002	1000	0.76	0.132	0.083	7.56	11.98	14.0	12.0	5.7	33.5	25.5	30.3	0.20
921002	1300	0.73	0.113	0.083	8.87	11.98	-16.0	10.0	0.5	33.2	25.1	28.4	0.20
921002	1600	0.70	0.113	0.083	8.87	11.98	-14.0	-14.0	-3.3	32.4	26.3	23.1	0.18
921002	1900	0.64	0.123	0.093	8.16	10.72	-14.0	-14.0	-9.3	31.1	29.1	23.3	0.21
921002	2200	0.61	0.123	0.093	8.16	10.72	-14.0	-16.0	-13.1	27.9	24.9	24.6	0.25
921003	0100	0.56	0.093	0.093	10.72	10.72	-24.0	-16.0	-17.1	26.1	24.3	18.7	0.23
921003	0400	0.54	0.093	0.093	10.72	10.72	-26.0	-26.0	-22.2	25.4	24.3	20.5	0.21
921003	0700	0.52	0.093	0.093	10.72	10.72	-26.0	-24.0	-23.7	22.5	21.6	17.2	0.20
921003	1000	0.49	0.093	0.093	10.72	10.72	-26.0	-24.0	-23.6	22.8	21.0	14.9	0.25
921003	1300	0.45	0.093	0.093	10.72	10.72	-34.0	-26.0	-28.0	23.8	23.3	21.4	0.27
921003	1600	0.47	0.093	0.093	10.72	10.72	-26.0	-26.0	-27.3	23.6	20.5	18.9	0.27
921003	1900	0.44	0.093	0.093	10.72	10.72	-20.0	-20.0	-24.4	22.4	21.0	15.9	0.25
921003	2200	0.44	0.093	0.093	10.72	10.72	-22.0	-22.0	-26.0	24.5	23.0	21.4	0.30
921004	0100	0.43	0.093	0.093	10.72	10.72	-30.0	-22.0	-27.8	25.8	24.1	26.1	0.33
921004	0400	0.43	0.093	0.093	10.72	10.72	-26.0	-24.0	-27.1	24.0	23.1	19.6	0.31
921004	0700	0.45	0.093	0.093	10.72	10.72	-26.0	-26.0	-25.8	22.1	20.5	18.1	0.28
921004	1000	0.55	0.064	0.093	15.63	10.72	-12.0	-26.0	-22.9	24.2	22.5	17.9	0.26
921004	1300	1.10	0.259	0.240	3.86	4.17	2.0	0.0	-7.5	42.0	39.9	33.5	0.16
921004	1600	1.65	0.181	0.191	5.52	5.24	-2.0	-2.0	2.1	33.2	31.0	30.9	0.09
921004	1900	2.54	0.152	0.152	6.59	6.59	16.0	12.0	16.0	35.2	34.9	27.9	0.12
921004	2200	3.59	0.132	0.132	7.56	7.56	18.0	18.0	22.5	31.0	32.0	22.1	0.17
921005	0100	3.76	0.113	0.113	8.87	8.87	8.0	10.0	14.1	29.3	29.7	24.0	0.16
921005	0400	3.36	0.113	0.113	8.87	8.87	6.0	6.0	11.6	34.7	28.7	25.4	0.16
921005	0700	3.94	0.113	0.113	8.87	8.87	14.0	14.0	19.4	31.3	31.1	30.1	0.18
921005	1000	4.00	0.103	0.103	9.71	9.71	14.0	12.0	20.8	28.6	29.1	24.4	0.19
921005	1300	3.92	0.103	0.103	9.71	9.71	12.0	14.0	18.9	28.5	27.4	22.4	0.20
921005	1600	3.72	0.093	0.093	10.72	10.72	10.0	14.0	19.9	29.7	27.8	22.0	0.19

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Table A1 (Continued)

Date	Time EST	H <sub>m</sub> m	f <sub>h/0</sub> Hz	f <sub>h/10</sub> Hz	T <sub>h/0</sub> sec	T <sub>h/10</sub> sec	θ <sub>h/0</sub> deg	θ <sub>h/10</sub> deg	θ <sub>h/20</sub> deg	Δθ <sub>h/0</sub> deg	Δθ <sub>h/10</sub> deg	Δθ <sub>h/20</sub> deg	X
921005	1900	3.39	0.093	0.093	10.72	10.72	10.0	10.0	18.4	29.3	28.2	19.3	0.18
921005	2200	3.16	0.093	0.093	10.72	10.72	12.0	12.0	15.0	28.4	27.5	21.9	0.16
921006	0100	2.89	0.093	0.093	10.72	10.72	10.0	12.0	21.8	30.7	27.1	21.2	0.16
921006	0400	2.57	0.093	0.103	10.72	9.71	12.0	12.0	20.6	31.5	28.5	27.5	0.17
921006	0700	2.42	0.093	0.093	10.72	10.72	10.0	12.0	19.1	29.6	27.9	21.0	0.15
921006	1000	2.34	0.113	0.103	8.87	9.71	10.0	12.0	15.4	29.6	27.4	26.5	0.15
921006	1300	2.16	0.103	0.093	9.71	10.72	10.0	10.0	16.4	33.1	29.3	28.3	0.15
921006	1600	2.24	0.093	0.093	10.72	10.72	10.0	10.0	18.0	32.5	29.2	27.3	0.15
921006	1900	2.16	0.093	0.093	10.72	10.72	8.0	8.0	13.8	32.0	29.8	24.9	0.14
921006	2200	2.08	0.103	0.103	9.71	9.71	10.0	8.0	11.9	31.1	30.5	24.3	0.13
921007	0100	1.84	0.113	0.103	8.87	9.71	10.0	8.0	5.9	32.7	32.1	28.1	0.12
921007	0400	1.65	0.093	0.093	10.72	10.72	-16.0	-14.0	1.7	32.5	31.6	24.9	0.14
921007	0700	1.62	0.093	0.093	10.72	10.72	-14.0	4.0	-2.1	30.5	30.5	26.6	0.13
921007	1000	1.59	0.083	0.083	11.98	11.98	-14.0	-14.0	-8.0	30.4	31.8	23.2	0.13
921007	1300	1.50	0.103	0.083	9.71	11.98	-12.0	-10.0	-1.9	30.5	32.3	24.7	0.13
921007	1600	1.39	0.093	0.093	10.72	10.72	-12.0	-14.0	-5.1	31.5	32.7	23.5	0.15
921007	1900	1.32	0.093	0.093	10.72	10.72	6.0	6.0	-3.2	31.5	32.2	26.7	0.15
921007	2200	1.29	0.083	0.093	11.98	10.72	-16.0	-16.0	-4.5	29.6	30.6	24.0	0.15
921008	0100	1.14	0.093	0.093	10.72	10.72	-18.0	-18.0	-13.2	28.9	30.0	24.7	0.16
921008	0400	1.14	0.083	0.083	11.98	11.98	-22.0	-20.0	-16.6	31.3	32.5	28.6	0.15
921008	0700	1.07	0.093	0.083	10.72	11.98	-20.0	-20.0	-16.2	30.1	32.6	25.1	0.17
921008	1000	1.07	0.083	0.083	11.98	11.98	-20.0	-20.0	-16.0	29.6	31.0	24.7	0.16
921008	1300	1.12	0.083	0.083	11.98	11.98	-14.0	-16.0	-14.2	28.3	29.2	19.6	0.16
921008	1600	1.12	0.083	0.083	11.98	11.98	-14.0	-14.0	-17.3	28.5	30.2	21.2	0.15
921008	1900	1.01	0.093	0.083	10.72	11.98	-4.0	-4.0	-17.6	33.2	32.3	25.0	0.16
921008	2200	0.99	0.083	0.083	11.98	11.98	-2.0	-6.0	-17.7	31.9	30.6	21.9	0.17
921009	0100	1.08	0.083	0.083	11.98	11.98	-2.0	-14.0	-24.4	37.7	31.4	26.2	0.19
921009	0700	1.26	0.152	0.074	6.59	13.56	-44.0	-16.0	-26.5	37.6	29.5	20.7	0.19
921009	1300	1.35	0.142	0.083	7.04	11.98	-42.0	-42.0	-33.8	35.8	25.8	20.8	0.17
921009	1600	1.47	0.123	0.132	8.16	7.56	-38.0	-40.0	-36.0	33.9	27.1	27.4	0.16
921009	1900	1.37	0.123	0.123	8.16	8.16	-40.0	-42.0	-38.2	32.1	27.8	23.1	0.15
921009	2200	1.30	0.123	0.123	8.16	8.16	-42.0	-42.0	-35.2	31.7	27.8	26.1	0.13
921010	0100	1.38	0.113	0.113	8.87	8.87	-42.0	-42.0	-36.9	31.7	30.4	35.3	0.14
921010	0400	1.49	0.113	0.113	8.87	8.87	-40.0	-42.0	-38.2	27.2	27.1	22.1	0.15
921010	0700	1.43	0.103	0.103	9.71	9.71	-40.0	-40.0	-39.0	24.6	25.1	20.2	0.15
921010	1000	1.32	0.103	0.103	9.71	9.71	-42.0	-40.0	-37.1	25.8	26.4	23.2	0.13
921010	1300	1.29	0.103	0.103	9.71	9.71	-40.0	-38.0	-35.7	25.0	24.9	19.7	0.13
921010	1600	1.22	0.113	0.113	8.87	8.87	-40.0	-40.0	-15.3	37.2	35.4	21.7	0.15
921010	1900	1.18	0.113	0.113	8.87	8.87	-40.0	-40.0	-15.4	40.4	40.5	28.2	0.15
921010	2200	1.02	0.113	0.113	8.87	8.87	-40.0	-40.0	-21.2	40.1	37.1	22.9	0.14
921011	0100	0.97	0.123	0.113	8.16	8.87	-40.0	-40.0	-28.1	39.6	38.8	30.0	0.14
921011	0400	0.89	0.113	0.113	8.87	8.87	-36.0	-40.0	-30.8	38.1	38.7	26.0	0.16
921011	0700	0.79	0.123	0.113	8.16	8.87	-42.0	-42.0	-32.2	36.6	36.0	32.3	0.19
921011	1000	0.70	0.123	0.123	8.16	8.15	-38.0	-38.0	-33.3	35.5	34.3	22.8	0.19
921011	1300	0.70	0.123	0.123	8.16	8.16	-40.0	-40.0	-33.6	34.0	32.4	21.3	0.17
921011	1600	0.71	0.132	0.132	7.56	7.56	-40.0	-40.0	-34.5	35.9	34.1	30.4	0.19
921011	1900	0.67	0.123	0.123	8.16	8.16	-38.0	-38.0	-36.2	33.4	30.3	27.3	0.19
921011	2200	0.60	0.113	0.113	8.87	8.87	-38.0	-42.0	-33.7	36.6	34.1	31.7	0.21
921012	0100	0.64	0.123	0.123	8.16	8.16	-36.0	-38.0	-4.5	77.8	28.7	32.5	0.19
921012	0400	1.02	0.191	0.201	5.24	4.98	52.0	52.0	34.2	42.7	18.8	10.3	0.16
921012	0700	1.03	0.191	0.191	5.24	5.24	50.0	50.0	37.4	25.1	19.0	10.1	0.15
921012	1000	0.82	0.181	0.181	5.52	5.52	46.0	50.0	34.3	32.1	21.0	12.2	0.16
921012	1300	0.67	0.201	0.123	4.98	8.16	46.0	44.0	25.5	47.5	25.1	36.4	0.16
921012	1600	0.58	0.132	0.123	7.56	8.16	-38.0	28.0	16.4	51.1	28.7	40.8	0.19
921012	1900	0.58	0.181	0.171	5.52	5.83	34.0	34.0	22.5	41.5	26.2	12.1	0.20
921012	2200	0.47	0.132	0.123	7.56	8.16	-38.0	34.0	3.7	55.7	29.1	38.1	0.21
921013	0100	0.41	0.132	0.123	7.56	8.16	-40.0	-38.0	-8.6	44.1	32.4	37.9	0.23

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Table A1 (Continued)

Date	Time EST	H <sub>m</sub> m	f <sub>A,0</sub> Hz	f <sub>A,10</sub> Hz	T <sub>A,0</sub> sec	T <sub>A,10</sub> sec	θ <sub>A,0</sub> deg	θ <sub>A,10</sub> deg	θ <sub>A,20</sub> deg	Δθ <sub>0-10</sub> deg	Δθ <sub>10-20</sub> deg	Δθ <sub>0-20</sub> deg	X
921013	0400	0.40	0.132	0.132	7.56	7.56	-42.0	-12.0	-22.5	39.3	34.8	38.2	0.31
921013	0700	0.35	0.142	0.132	7.04	7.56	-42.0	-42.0	-26.2	40.8	33.2	31.0	0.31
921013	1000	0.34	0.083	0.083	11.98	11.98	-14.0	-16.0	-22.3	34.0	30.1	19.7	0.26
921013	1300	0.36	0.132	0.132	7.56	7.56	-38.0	-14.0	-26.9	32.3	28.8	25.7	0.24
921013	1600	0.37	0.093	0.083	10.72	11.98	-12.0	-12.0	-22.6	34.4	26.3	25.5	0.28
921013	1900	0.37	0.093	0.132	10.72	7.56	-12.0	-14.0	-24.6	34.8	30.1	24.4	0.32
921013	2200	0.36	0.083	0.083	11.98	11.98	-12.0	-14.0	-23.3	35.0	33.2	23.8	0.28
921014	0100	0.36	0.142	0.113	7.04	8.87	-40.0	-14.0	-16.1	33.5	30.8	26.6	0.25
921014	0400	0.36	0.113	0.123	8.87	8.16	8.0	-12.0	-10.8	36.1	30.8	30.6	0.31
921014	0700	0.36	0.113	0.123	8.87	8.16	10.0	-12.0	-14.3	36.1	31.0	27.2	0.32
921014	1000	0.36	0.093	0.113	10.72	8.87	-14.0	-14.0	-17.0	36.9	31.2	25.9	0.31
921014	1600	0.39	0.093	0.093	10.72	10.72	-12.0	-12.0	-25.0	37.1	27.1	27.7	0.29
921014	1900	0.39	0.289	0.103	3.47	9.71	-58.0	-58.0	-22.7	45.0	23.5	24.9	0.30
921014	2200	0.35	0.093	0.093	10.72	10.72	8.0	-18.0	-18.5	36.5	23.4	24.4	0.26
921015	0100	0.34	0.093	0.103	10.72	9.71	-12.0	-16.0	-14.8	35.0	28.0	26.5	0.24
921015	0400	0.36	0.123	0.103	8.16	9.71	-32.0	-20.0	-15.4	36.5	32.7	35.2	0.28
921015	0700	0.37	0.103	0.103	9.71	9.71	-14.0	-14.0	-23.9	34.0	27.0	23.4	0.33
921015	1300	0.37	0.113	0.113	8.87	8.87	-18.0	-20.0	-24.6	27.7	23.1	23.6	0.24
921015	1600	0.38	0.113	0.113	8.87	8.87	-20.0	-20.0	-21.3	27.5	23.8	23.0	0.23
921015	1900	0.37	0.113	0.113	8.87	8.87	-22.0	-20.0	-25.7	30.6	25.6	24.2	0.29
921015	2200	0.34	0.113	0.113	8.87	8.87	-18.0	-18.0	-23.2	28.7	25.5	24.3	0.25
921016	0100	0.29	0.113	0.113	8.87	8.87	-20.0	-20.0	-24.7	28.8	24.5	20.4	0.24
921016	0400	0.28	0.123	0.113	8.16	8.87	-24.0	-24.0	-27.2	28.5	24.4	27.7	0.27
921016	1000	0.30	0.113	0.113	8.87	8.87	-22.0	-20.0	-28.5	29.5	26.6	22.0	0.31
921016	1300	0.28	0.123	0.123	8.16	8.16	-36.0	-24.0	-28.8	32.0	25.6	25.1	0.25
921016	1600	0.30	0.318	0.123	3.15	8.16	-54.0	-52.0	-31.2	36.2	19.0	18.7	0.27
921016	1900	0.29	0.240	0.123	4.17	8.16	-54.0	-54.0	-31.2	43.7	20.3	30.2	0.30
921016	2200	0.36	0.210	0.210	4.75	4.75	-54.0	-54.0	-39.7	34.7	15.7	6.1	0.25
921017	0100	0.39	0.152	0.171	6.59	5.83	-44.0	-54.0	-40.7	29.4	14.4	7.9	0.20
921017	0400	0.82	0.230	0.230	4.35	4.35	62.0	64.0	48.7	21.8	16.4	6.5	0.23
921017	0700	1.99	0.152	0.152	6.59	6.59	44.0	42.0	46.8	19.8	18.8	14.0	0.19
921017	1000	1.75	0.162	0.152	6.19	6.59	42.0	42.0	43.4	21.8	19.2	18.3	0.21
921017	1300	1.71	0.142	0.142	7.04	7.04	22.0	52.0	38.9	25.1	17.5	16.0	0.20
921017	1600	1.53	0.152	0.152	6.59	6.59	36.0	36.0	39.5	27.1	20.5	18.7	0.16
921017	1900	1.33	0.162	0.181	6.19	5.52	30.0	32.0	39.0	28.7	23.0	18.4	0.16
921017	2200	1.24	0.210	0.201	4.75	4.98	42.0	38.0	38.9	29.6	24.4	19.9	0.16
921018	0100	1.22	0.210	0.210	4.75	4.75	34.0	34.0	36.7	33.8	28.5	20.3	0.14
921018	0400	1.33	0.181	0.181	5.52	5.52	24.0	22.0	30.8	31.5	27.9	19.7	0.10
921018	0700	1.35	0.171	0.181	5.83	5.52	18.0	24.0	27.3	33.9	30.6	23.0	0.10
921018	1000	1.34	0.171	0.181	5.83	5.52	22.0	26.0	25.7	39.2	35.8	28.4	0.13
921018	1300	1.30	0.171	0.171	5.83	5.83	14.0	28.0	27.4	41.4	35.5	31.5	0.13
921018	1600	1.29	0.171	0.171	5.83	5.83	12.0	14.0	25.9	38.7	30.9	25.7	0.12
921018	1900	1.46	0.162	0.171	6.19	5.83	14.0	38.0	27.3	34.5	26.3	24.3	0.13
921018	2200	1.51	0.162	0.162	6.19	6.19	14.0	12.0	24.4	35.6	25.8	21.1	0.15
921019	0100	1.53	0.152	0.152	6.59	6.59	8.0	8.0	15.5	29.0	24.6	19.2	0.17
921019	0400	1.32	0.103	0.103	9.71	9.71	-10.0	8.0	11.7	28.9	23.4	22.5	0.15
921019	0700	1.14	0.103	0.103	9.71	9.71	6.0	6.0	17.6	37.8	20.8	22.2	0.17
921019	1000	1.37	0.308	0.103	3.25	9.71	56.0	54.0	38.6	44.4	17.4	20.5	0.24
921019	1300	1.35	0.171	0.162	5.83	6.19	46.0	46.0	40.7	29.8	15.0	14.8	0.28
921019	1600	1.46	0.162	0.162	6.19	6.19	44.0	44.0	40.3	22.0	15.2	11.2	0.22
921019	1900	1.40	0.152	0.152	6.59	6.59	26.0	42.0	35.5	24.4	16.7	15.8	0.20
921019	2200	1.60	0.152	0.142	6.59	7.04	36.0	36.0	37.2	25.0	17.7	17.2	0.21
921020	0100	1.54	0.152	0.152	6.59	6.59	40.0	42.0	32.1	29.4	19.9	18.9	0.21
921020	0400	1.35	0.152	0.152	6.59	6.59	26.0	40.0	27.8	31.6	22.3	14.5	0.18
921020	0700	1.24	0.093	0.093	10.72	10.72	-12.0	28.0	22.8	32.6	24.2	27.0	0.16
921020	1000	1.24	0.093	0.093	10.72	10.72	-12.0	16.0	16.7	35.2	25.7	27.2	0.17
921020	1300	1.21	0.093	0.093	10.72	10.72	10.0	12.0	17.2	35.5	26.5	27.5	0.20
921020	1600	1.14	0.083	0.093	11.98	10.72	12.0	14.0	13.2	33.8	29.8	31.8	0.21

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{s,ms}$ Hz	$T_{s,ms}$ sec	$T_{s,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\lambda$
921020	1900	1.24	0.093	0.093	10.72	10.72	12.0	12.0	12.5	29.7	28.3	29.5	0.16
921020	2200	1.21	0.083	0.083	11.98	11.98	10.0	12.0	-0.5	29.1	28.1	30.7	0.17
921021	0100	1.10	0.083	0.083	11.98	11.98	-12.0	-12.0	-5.9	28.1	27.1	24.9	0.21
921021	0400	0.99	0.083	0.083	11.98	11.98	-8.0	-10.0	-7.6	27.5	27.6	24.0	0.20
921021	0700	0.88	0.093	0.093	10.72	10.72	-14.0	-12.0	-6.8	29.7	29.1	27.8	0.17
921021	1000	0.83	0.093	0.093	10.72	10.72	-14.0	-12.0	-3.8	28.6	28.6	27.5	0.20
921021	1300	0.74	0.093	0.093	10.72	10.72	-14.0	-12.0	-9.8	28.9	29.1	28.2	0.28
921021	1600	0.69	0.093	0.093	10.72	10.72	-14.0	-14.0	-16.3	29.4	29.3	26.5	0.25
921021	1900	0.68	0.093	0.093	10.72	10.72	-12.0	-14.0	-14.3	29.2	28.4	28.6	0.18
921021	2200	0.68	0.103	0.103	9.71	9.71	-14.0	-14.0	-16.3	28.7	29.4	26.7	0.19
921022	0100	0.66	0.103	0.103	9.71	9.71	6.0	-12.0	-2.6	28.7	29.6	27.1	0.26
921022	0400	1.00	0.103	0.103	9.71	9.71	-16.0	58.0	31.6	59.8	27.7	26.2	0.22
921022	0700	1.33	0.201	0.201	4.98	4.98	44.0	44.0	35.8	37.2	26.5	17.2	0.14
921022	1000	1.32	0.230	0.191	4.35	5.24	50.0	48.0	35.1	37.4	24.0	19.9	0.15
921022	1300	1.39	0.171	0.171	5.83	5.83	30.0	54.0	34.5	36.6	22.6	13.7	0.18
921022	1600	1.25	0.171	0.171	5.83	5.83	34.0	42.0	31.8	36.8	24.6	16.1	0.18
921022	1900	1.25	0.171	0.171	5.83	5.83	34.0	26.0	28.8	34.5	25.3	18.4	0.14
921022	2200	1.19	0.171	0.171	5.83	5.83	22.0	24.0	23.3	34.0	25.2	17.7	0.12
921023	0100	1.18	0.181	0.181	5.52	5.52	20.0	18.0	19.1	37.1	27.8	20.2	0.13
921023	0400	1.23	0.152	0.171	6.59	5.83	12.0	12.0	16.6	35.9	28.5	22.3	0.14
921023	0700	1.24	0.162	0.162	6.19	6.19	16.0	14.0	18.2	38.3	27.9	16.6	0.14
921023	1000	1.17	0.162	0.162	6.19	6.19	14.0	12.0	15.4	38.9	29.7	22.4	0.12
921023	1300	1.11	0.162	0.113	6.19	8.87	14.0	10.0	7.0	34.0	29.9	24.8	0.13
921023	1600	1.01	0.162	0.103	6.19	9.71	12.0	10.0	3.9	33.6	31.0	24.5	0.16
921023	1900	0.93	0.093	0.113	10.72	8.87	-16.0	-14.0	2.5	32.8	29.9	25.4	0.18
921023	2200	0.95	0.113	0.113	8.87	8.87	-14.0	-12.0	-2.5	29.7	29.2	22.0	0.13
921024	0100	0.94	0.123	0.123	8.16	8.16	-14.0	-14.0	-1.0	31.7	31.7	24.8	0.17
921024	0400	0.95	0.103	0.103	9.71	9.71	-14.0	10.0	1.5	33.5	34.0	28.3	0.20
921024	0700	0.88	0.103	0.103	9.71	9.71	-12.0	-14.0	3.3	33.0	33.4	23.2	0.20
921024	1000	0.83	0.093	0.103	10.72	9.71	-14.0	-16.0	-6.0	31.3	32.1	31.4	0.15
921024	1300	0.82	0.103	0.103	9.71	9.71	-14.0	-14.0	-13.2	29.3	29.3	25.0	0.16
921024	1600	0.90	0.113	0.103	8.87	9.71	-18.0	-16.0	-19.9	31.2	27.5	29.6	0.22
921024	1900	0.87	0.103	0.103	9.71	9.71	-18.0	-18.0	-24.1	30.5	24.9	27.0	0.22
921024	2200	0.82	0.103	0.103	9.71	9.71	-16.0	-16.0	-19.6	25.3	23.0	22.5	0.16
921025	0100	0.87	0.083	0.083	11.98	11.98	-22.0	-18.0	-22.9	27.5	28.2	23.4	0.19
921025	0400	1.31	0.201	0.083	4.98	11.98	56.0	54.0	27.0	71.7	18.7	22.2	0.24
921025	0700	1.47	0.171	0.083	5.83	11.98	50.0	58.0	31.5	56.7	15.8	22.8	0.28
921025	1000	1.55	0.171	0.162	5.83	6.19	42.0	42.0	27.7	49.7	15.9	8.6	0.20
921025	1300	1.51	0.152	0.074	6.59	13.56	24.0	38.0	18.5	48.8	19.4	16.7	0.17
921025	1600	1.42	0.074	0.074	13.56	13.56	-6.0	34.0	18.3	50.2	20.8	17.2	0.19
921025	1900	1.28	0.074	0.074	13.56	13.56	-18.0	32.0	15.2	48.6	20.8	20.8	0.23
921025	2200	1.17	0.074	0.074	13.56	13.56	-20.0	-18.0	9.0	48.3	20.7	19.0	0.20
921026	0100	1.19	0.074	0.074	13.56	13.56	-12.0	24.0	14.3	43.1	19.3	18.3	0.15
921026	0400	1.11	0.074	0.074	13.56	13.56	-18.0	24.0	15.6	45.0	20.7	19.3	0.18
921026	0700	1.07	0.181	0.074	5.52	13.56	28.0	26.0	18.7	35.3	22.0	25.8	0.20
921026	1000	0.98	0.142	0.074	7.04	13.56	22.0	24.0	21.0	33.1	21.1	24.5	0.19
921026	1300	0.86	0.083	0.083	11.98	11.98	-14.0	22.0	15.1	36.6	21.2	22.0	0.16
921026	1600	0.75	0.142	0.083	7.04	11.98	20.0	20.0	9.0	38.7	24.3	28.3	0.24
921026	1900	0.63	0.074	0.074	13.56	13.56	-4.0	18.0	0.0	41.8	25.5	21.6	0.24
921026	2200	0.47	0.083	0.083	11.98	11.98	-14.0	-14.0	-14.4	43.1	25.6	24.0	0.28
921027	0100	0.36	0.083	0.083	11.98	11.98	-14.0	-12.0	-16.9	35.3	30.6	27.0	0.23
921027	0400	0.32	0.083	0.083	11.98	11.98	-14.0	-14.0	-22.6	33.8	30.7	23.0	0.44
921027	0700	0.29	0.083	0.083	11.98	11.98	-6.0	-16.0	-19.5	34.0	33.9	25.6	0.37
921027	1600	0.30	0.083	0.083	11.98	11.98	-14.0	-16.0	-5.8	43.4	46.5	26.7	0.40
921027	1900	0.42	0.259	0.083	3.86	11.98	58.0	60.0	30.4	77.1	31.7	29.7	0.33
921027	2200	0.58	0.210	0.210	4.75	4.75	48.0	48.0	41.7	35.2	20.8	10.4	0.20
921028	0100	0.60	0.210	0.210	4.75	4.75	50.0	48.0	36.7	36.9	24.0	10.9	0.15

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Table A1 (Continued)

Date	Time EST	$N_{\text{m}}$ m	$f_{\text{Ave}}$ Hz	$f_{\text{Ave}}$ Hz	$T_{\text{Ave}}$ sec	$T_{\text{Ave}}$ sec	$\theta_{\text{Ave}}$ deg	$\theta_{\text{Ave}}$ deg	$\theta_{\text{Ave}}$ deg	$\Delta\theta_{\text{m}}$ deg	$\Delta\theta_{\text{m}}$ deg	$\Delta\theta_{\text{m}}$ deg	$\lambda$
921028	0400	0.66	0.201	0.220	4.98	4.54	44.0	30.0	25.9	37.9	28.0	20.6	0.16
921028	0700	0.64	0.191	0.210	5.24	4.75	36.0	34.0	20.8	40.2	31.4	23.9	0.19
921028	1000	0.61	0.083	0.210	11.98	4.75	-14.0	32.0	15.2	45.2	40.7	37.0	0.20
921028	1300	0.53	0.083	0.083	11.98	11.98	-8.0	36.0	14.2	46.5	36.9	26.9	0.18
921028	1600	0.51	0.152	0.083	6.59	11.98	-48.0	16.0	1.5	50.7	36.6	27.7	0.20
921028	1900	0.50	0.083	0.240	11.98	4.17	-12.0	16.0	0.7	49.6	37.0	28.4	0.20
921028	2200	0.48	0.230	0.093	4.35	10.72	18.0	18.0	-3.1	48.6	37.9	33.1	0.22
921029	0100	0.44	0.064	0.093	15.63	10.72	-14.0	14.0	-4.8	44.9	35.2	35.9	0.20
921029	0400	0.43	0.064	0.064	15.63	15.63	-16.0	-16.0	-5.4	42.4	37.2	20.8	0.22
921029	0700	0.43	0.064	0.064	15.63	15.63	-16.0	-14.0	-2.2	42.7	40.1	16.8	0.29
921029	1000	0.42	0.064	0.064	15.63	15.63	-14.0	-14.0	-1.9	41.3	35.8	14.5	0.31
921029	1300	0.42	0.064	0.064	15.63	15.63	-14.0	-14.0	0.3	46.8	43.2	21.4	0.26
921029	1600	0.43	0.064	0.064	15.63	15.63	-16.0	-16.0	-8.5	47.4	47.7	19.0	0.24
921029	1900	0.47	0.064	0.064	15.63	15.63	-12.0	-12.0	-1.4	42.6	44.4	18.3	0.29
921029	2200	0.46	0.064	0.064	15.63	15.63	-14.0	-14.0	1.3	39.3	38.0	25.5	0.32
921030	0100	0.47	0.064	0.064	15.63	15.63	-10.0	-10.0	-4.1	39.5	40.9	32.4	0.32
921030	0400	0.52	0.074	0.074	13.56	13.56	-12.0	-12.0	-14.8	37.2	39.7	30.8	0.31
921030	0700	0.58	0.074	0.074	13.56	13.56	-6.0	-8.0	-13.2	34.8	36.2	24.9	0.33
921030	1000	0.60	0.074	0.074	13.56	13.56	-8.0	-8.0	-8.4	33.5	37.0	25.7	0.33
921030	1300	0.61	0.074	0.074	13.56	13.56	-10.0	-12.0	-6.1	31.8	36.1	25.1	0.44
921030	1600	0.61	0.074	0.074	13.56	13.56	-12.0	-10.0	-7.6	32.1	34.6	26.4	0.26
921030	1900	0.63	0.074	0.074	13.56	13.56	-10.0	-8.0	-2.5	32.7	34.6	28.0	0.28
921030	2200	0.71	0.074	0.074	13.56	13.56	-6.0	-8.0	5.1	36.6	33.3	27.1	0.27
921031	0100	0.78	0.074	0.074	13.56	13.56	-8.0	20.0	9.7	39.5	31.9	28.3	0.19
921031	0400	0.82	0.074	0.074	13.56	13.56	-12.0	18.0	10.8	37.1	26.2	29.2	0.21
921031	0700	1.34	0.181	0.201	5.52	4.98	40.0	42.0	36.8	30.1	25.7	23.7	0.14
921031	1000	1.43	0.152	0.152	6.59	6.59	40.0	42.0	36.4	31.8	28.7	15.5	0.16
921031	1300	1.53	0.152	0.152	6.59	6.59	16.0	40.0	33.3	33.0	27.2	27.7	0.19
921031	1600	1.79	0.142	0.142	7.04	7.04	16.0	18.0	24.3	32.8	27.7	26.3	0.16
921031	1900	1.92	0.123	0.123	8.16	8.16	-2.0	18.0	19.3	35.1	31.1	32.4	0.15
921031	2200	1.74	0.123	0.123	8.16	8.16	0.0	4.0	19.5	34.7	30.4	30.1	0.17
921101	0100	1.53	0.123	0.123	8.16	8.16	4.0	12.0	17.7	37.3	31.9	36.5	0.17
921101	0400	1.61	0.113	0.123	8.87	8.16	2.0	6.0	6.6	33.8	31.6	37.4	0.16
921101	0700	1.65	0.103	0.113	9.71	8.87	-2.0	0.0	3.6	32.1	31.6	29.3	0.15
921101	1000	1.55	0.093	0.093	10.72	10.72	2.0	4.0	7.2	31.2	31.6	26.7	0.16
921101	1300	1.46	0.083	0.083	11.98	11.98	8.0	2.0	6.3	32.2	32.4	29.0	0.18
921101	1600	1.42	0.083	0.083	11.98	11.98	-2.0	0.0	2.9	28.7	28.7	23.5	0.17
921101	1900	1.50	0.083	0.083	11.98	11.98	4.0	0.0	2.8	29.1	29.3	30.3	0.17
921101	2200	1.59	0.083	0.083	11.98	11.98	0.0	0.0	1.8	32.6	32.7	30.9	0.15
921102	0100	1.43	0.093	0.093	10.72	10.72	2.0	2.0	4.6	34.6	34.2	28.0	0.15
921102	0400	1.46	0.103	0.093	9.71	10.72	-2.0	2.0	4.1	34.0	35.2	29.1	0.14
921102	0700	1.38	0.093	0.093	10.72	10.72	0.0	4.0	5.5	35.6	36.3	24.6	0.13
921102	1000	1.31	0.093	0.113	10.72	8.87	0.0	4.0	7.7	37.6	38.1	26.7	0.15
921102	1300	1.24	0.123	0.093	8.16	10.72	4.0	6.0	7.2	42.1	41.1	30.0	0.16
921102	1600	1.27	0.123	0.123	8.16	8.16	2.0	6.0	-13.8	47.9	40.5	24.2	0.14
921102	1900	1.45	0.123	0.142	8.16	7.04	4.0	6.0	-22.0	47.9	38.4	39.4	0.14
921102	2200	1.56	0.142	0.142	7.04	7.04	-34.0	8.0	-24.4	45.7	39.3	40.1	0.14
921103	0100	1.59	0.123	0.142	8.16	7.04	2.0	2.0	-28.3	44.5	37.8	40.6	0.16
921103	0400	1.60	0.142	0.142	7.04	7.04	-40.0	-40.0	-31.0	41.1	35.0	41.7	0.16
921103	0700	1.44	0.142	0.132	7.04	7.56	-40.0	-40.0	-17.7	39.4	36.6	38.0	0.13
921103	1000	1.39	0.132	0.132	7.56	7.56	-42.0	-42.0	-30.4	42.0	38.6	41.5	0.13
921103	1300	1.34	0.123	0.123	8.16	8.16	6.0	6.0	-4.2	41.7	42.2	38.1	0.18
921103	1600	1.20	0.113	0.093	8.87	10.72	4.0	4.0	-5.6	43.5	43.3	35.1	0.16
921103	1900	1.11	0.103	0.103	9.71	9.71	4.0	4.0	-13.5	41.3	40.9	29.4	0.14
921103	2200	1.01	0.103	0.103	9.71	9.71	4.0	4.0	-1.5	42.1	42.4	32.0	0.18
921104	0100	1.03	0.103	0.103	9.71	9.71	6.0	6.0	-5.7	41.5	42.6	35.5	0.20
921104	0400	1.04	0.083	0.083	11.98	11.98	2.0	4.0	-5.0	42.5	42.7	40.1	0.19
921104	0700	1.06	0.093	0.093	10.72	10.72	0.0	2.0	-6.2	41.2	41.7	35.4	0.16

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{A,ms}$ Hz	$f_{B,ms}$ Hz	$T_{A,ms}$ sec	$T_{B,ms}$ sec	$\theta_{A,ms}$ deg	$\theta_{B,ms}$ deg	$\theta_{C,ms}$ deg	$\Delta\theta_{AB}$ deg	$\Delta\theta_{BC}$ deg	$\Delta\theta_{AC}$ deg	$x$
921104	1000	1.06	0.093	0.093	10.72	10.72	0.0	4.0	-9.2	40.8	41.9	35.1	0.20
921104	1300	1.09	0.083	0.083	11.98	11.98	2.0	2.0	-9.9	38.1	40.0	37.0	0.20
921104	1600	1.09	0.083	0.083	11.98	11.98	0.0	0.0	-5.7	34.5	36.2	36.1	0.22
921104	1900	1.07	0.083	0.083	11.98	11.98	-2.0	2.0	-8.5	30.9	32.4	31.0	0.18
921104	2200	1.08	0.074	0.083	13.56	11.98	-10.0	-8.0	-7.7	31.7	31.9	33.1	0.21
921105	0100	1.10	0.074	0.074	13.56	13.56	-4.0	-8.0	-8.2	29.1	27.5	22.7	0.20
921105	0400	1.08	0.083	0.083	11.98	11.98	-14.0	-12.0	-24.0	34.2	26.4	26.2	0.19
921105	0700	0.97	0.074	0.074	13.56	13.56	-16.0	-16.0	-23.3	38.1	25.2	22.9	0.16
921105	1000	0.91	0.074	0.074	13.56	13.56	-18.0	-42.0	-22.0	38.9	25.3	19.9	0.17
921105	1300	0.89	0.132	0.074	7.56	13.56	-42.0	-42.0	-23.1	40.6	24.3	26.4	0.22
921105	1600	0.87	0.074	0.074	13.56	13.56	-12.0	-42.0	-23.4	41.4	21.9	19.9	0.21
921105	1900	0.82	0.074	0.074	13.56	13.56	-16.0	-16.0	-24.7	38.9	24.0	22.7	0.21
921105	2200	0.86	0.074	0.074	13.56	13.56	-12.0	-42.0	-27.4	39.4	23.6	21.6	0.21
921106	0100	1.69	0.181	0.162	5.52	6.19	52.0	52.0	35.2	22.7	18.0	11.1	0.13
921106	0400	1.74	0.162	0.162	6.19	6.19	42.0	42.0	35.4	21.0	17.0	9.8	0.16
921106	0700	1.52	0.162	0.162	6.19	6.19	34.0	36.0	29.9	24.8	18.6	12.3	0.15
921106	1000	1.56	0.152	0.152	6.59	6.59	28.0	28.0	31.0	26.8	19.6	10.9	0.11
921106	1300	1.34	0.152	0.152	6.59	6.59	24.0	26.0	27.2	27.8	22.9	15.3	0.13
921106	1600	1.09	0.152	0.152	6.59	6.59	24.0	24.0	25.7	32.0	22.9	10.6	0.16
921106	1900	0.95	0.162	0.074	6.19	13.56	26.0	26.0	17.8	39.3	24.3	24.9	0.19
921106	2200	0.90	0.064	0.074	15.63	13.56	-18.0	26.0	13.1	44.9	25.7	26.2	0.18
921107	0100	0.82	0.074	0.074	13.56	13.56	-22.0	24.0	10.2	44.8	28.9	26.3	0.24
921107	0400	0.80	0.074	0.074	13.56	13.56	-16.0	44.0	12.0	47.7	26.2	22.3	0.22
921107	0700	0.76	0.074	0.074	13.56	13.56	-16.0	36.0	5.9	46.8	24.3	23.7	0.27
921107	1000	0.72	0.064	0.074	15.63	13.56	-18.0	-16.0	2.3	44.4	24.5	22.4	0.27
921107	1300	0.67	0.074	0.074	13.56	13.56	-20.0	-16.0	-1.7	41.6	27.2	21.6	0.27
921107	1600	0.75	0.064	0.064	15.63	15.63	-20.0	-20.0	10.2	52.3	23.4	13.7	0.22
921107	1900	0.75	0.240	0.064	4.17	15.63	48.0	48.0	10.5	53.8	21.5	16.6	0.25
921107	2200	0.71	0.074	0.074	13.56	13.56	-12.0	-14.0	7.0	46.9	20.8	14.4	0.23
921108	0100	0.79	0.210	0.210	4.75	4.75	22.0	22.0	15.9	41.0	23.7	20.2	0.16
921108	0400	0.93	0.181	0.181	5.52	5.52	24.0	22.0	22.2	31.2	23.6	19.2	0.14
921108	0700	0.93	0.181	0.201	5.52	4.98	28.0	38.0	27.7	30.1	19.4	18.5	0.15
921108	1000	1.04	0.162	0.181	6.19	5.52	16.0	18.0	26.7	26.2	18.6	14.2	0.13
921108	1300	1.12	0.162	0.152	6.19	6.59	20.0	20.0	22.6	27.1	19.9	17.4	0.11
921108	1600	1.09	0.152	0.152	6.59	6.59	14.0	16.0	18.6	24.4	19.7	12.4	0.14
921108	1900	1.05	0.152	0.152	6.59	6.59	14.0	14.0	18.1	20.7	17.9	10.7	0.14
921108	2200	1.06	0.142	0.152	7.04	6.59	14.0	14.0	19.5	22.3	19.1	13.1	0.12
921109	0100	1.15	0.132	0.132	7.56	7.56	0.0	14.0	17.4	30.9	24.6	23.8	0.16
921109	0400	1.20	0.132	0.132	7.56	7.56	2.0	14.0	17.1	35.5	27.4	21.4	0.20
921109	0700	1.18	0.132	0.132	7.56	7.56	6.0	12.0	18.7	37.3	28.2	25.9	0.18
921109	1000	1.22	0.123	0.132	8.16	7.56	10.0	14.0	21.3	37.3	27.2	24.3	0.13
921109	1300	1.23	0.113	0.123	8.87	8.16	-18.0	10.0	13.7	37.3	29.5	27.0	0.13
921109	1600	1.26	0.132	0.113	7.56	8.87	2.0	10.0	16.1	34.9	28.9	26.3	0.14
921109	1900	1.20	0.103	0.113	9.71	8.87	2.0	10.0	14.7	36.0	28.8	24.7	0.14
921109	2200	1.21	0.093	0.103	10.72	9.71	4.0	10.0	15.9	38.5	30.8	30.3	0.14
921110	0100	1.21	0.103	0.113	9.71	8.87	0.0	4.0	12.6	35.9	31.1	24.2	0.14
921110	0400	1.24	0.123	0.123	8.16	8.16	-4.0	0.0	11.4	35.8	33.3	27.2	0.16
921110	0700	1.29	0.113	0.103	8.87	9.71	-4.0	10.0	7.8	35.3	34.0	31.1	0.15
921110	1000	1.34	0.103	0.103	9.71	9.71	6.0	8.0	4.0	35.9	34.5	29.0	0.13
921110	1300	1.37	0.083	0.083	11.98	11.98	-6.0	-4.0	-1.0	32.6	32.6	27.0	0.12
921110	1600	1.28	0.083	0.093	11.98	10.72	-10.0	-10.0	2.8	33.2	33.8	28.0	0.13
921110	1900	1.19	0.083	0.093	11.98	10.72	-4.0	2.0	-0.5	32.6	32.8	34.2	0.15
921110	2200	1.14	0.093	0.093	10.72	10.72	-2.0	4.0	3.7	30.3	31.1	27.0	0.15
921111	0100	1.18	0.093	0.093	10.72	10.72	-2.0	2.0	0.5	31.4	32.4	25.6	0.14
921111	0400	1.11	0.083	0.083	11.98	11.98	-12.0	-12.0	-2.3	28.5	30.7	18.4	0.17
921111	0700	1.02	0.083	0.083	11.98	11.98	-8.0	-6.0	-2.9	30.2	32.6	20.4	0.19
921111	1000	0.93	0.083	0.083	11.98	11.98	-2.0	2.0	-5.3	33.2	34.0	29.7	0.18
921111	1300	0.94	0.093	0.093	10.72	10.72	0.0	0.0	-8.1	32.5	32.7	30.1	0.13

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Table A1 (Continued)

Date	Time EST	H <sub>ms</sub> m	f <sub>AP</sub> Hz	f <sub>AP</sub> Hz	T <sub>AP</sub> sec	T <sub>AP</sub> sec	θ <sub>AP</sub> deg	θ <sub>AP</sub> deg	θ <sub>AP</sub> deg	Δθ <sub>AP</sub> deg	Δθ <sub>AP</sub> deg	Δθ <sub>AP</sub> deg	X
921111	1600	0.96	0.093	0.093	10.72	10.72	-2.0	-2.0	-13.2	32.5	31.8	27.0	0.17
921111	1900	0.90	0.093	0.093	10.72	10.72	-2.0	-20.0	-16.6	34.5	33.7	33.2	0.21
921111	2200	0.84	0.093	0.093	10.72	10.72	-2.0	-26.0	-20.0	35.2	35.1	35.4	0.17
921112	0100	0.78	0.093	0.093	10.72	10.72	4.0	4.0	-20.2	33.7	32.4	31.7	0.14
921112	0400	0.78	0.093	0.093	10.72	10.72	2.0	-24.0	-13.9	35.2	33.2	35.1	0.20
921112	0700	0.75	0.093	0.103	10.72	9.71	-16.0	-22.0	-28.2	34.4	32.4	31.4	0.22
921112	1000	0.71	0.103	0.103	9.71	9.71	-2.0	-24.0	-18.4	34.5	32.4	31.8	0.21
921112	1300	0.68	0.103	0.103	9.71	9.71	-18.0	-18.0	-19.7	29.3	27.0	31.2	0.16
921112	1600	0.76	0.318	0.103	3.15	9.71	-54.0	-14.0	-25.5	35.6	27.3	30.2	0.20
921112	1900	1.19	0.298	0.103	3.35	9.71	-54.0	-54.0	-39.8	30.4	20.2	29.2	0.23
921112	2200	1.23	0.142	0.142	7.04	7.04	-40.0	-44.0	-39.1	27.3	18.4	12.3	0.21
921113	0100	1.12	0.132	0.113	7.56	8.87	-38.0	-40.0	-37.5	26.2	18.0	23.2	0.17
921113	0400	1.07	0.142	0.093	7.04	10.72	-42.0	-42.0	-36.6	28.0	21.3	29.7	0.16
921113	0700	0.99	0.113	0.113	8.87	8.87	-40.0	-42.0	-37.3	27.7	22.5	25.6	0.19
921113	1000	1.19	0.220	0.103	4.54	9.71	58.0	58.0	21.7	86.7	24.9	35.6	0.19
921113	1300	1.41	0.181	0.181	5.52	5.52	52.0	52.0	28.7	51.9	25.5	17.1	0.14
921113	1600	1.30	0.103	0.093	9.71	10.72	-38.0	30.0	12.7	63.6	28.9	28.4	0.12
921113	1900	1.15	0.093	0.093	10.72	10.72	-26.0	-28.0	3.6	60.7	33.3	26.7	0.13
921113	2200	0.96	0.093	0.093	10.72	10.72	-26.0	-28.0	6.2	58.3	35.0	28.7	0.15
921114	0100	0.81	0.103	0.103	9.71	9.71	-36.0	-26.0	-5.6	56.8	32.8	37.4	0.14
921114	0400	0.79	0.113	0.103	8.87	9.71	-26.0	-26.0	-11.7	49.6	33.3	35.3	0.15
921114	0700	0.89	0.113	0.103	8.87	9.71	-40.0	-40.0	0.7	66.4	33.1	37.3	0.18
921114	1000	0.89	0.113	0.103	8.87	9.71	-42.0	-40.0	4.7	74.4	28.9	32.8	0.18
921114	1300	0.88	0.113	0.103	8.87	9.71	-36.0	-36.0	6.9	66.9	29.9	34.3	0.14
921114	1600	0.89	0.113	0.103	8.87	9.71	-32.0	-32.0	11.7	67.9	29.9	34.5	0.12
921114	1900	0.81	0.103	0.103	9.71	9.71	-36.0	-26.0	9.2	64.7	35.4	38.1	0.15
921114	2200	0.75	0.132	0.103	7.56	9.71	-30.0	-38.0	4.0	59.3	35.3	35.7	0.17
921115	0100	0.66	0.103	0.103	9.71	9.71	2.0	-34.0	4.3	55.0	33.2	33.9	0.15
921115	0400	0.60	0.103	0.103	9.71	9.71	-36.0	8.0	0.2	48.2	34.2	37.5	0.15
921115	0700	0.57	0.113	0.103	8.87	9.71	-24.0	-22.0	-4.4	43.2	35.2	37.6	0.20
921115	1000	0.53	0.113	0.103	8.87	9.71	-38.0	-36.0	-22.0	41.5	36.6	39.2	0.21
921115	1300	0.49	0.113	0.103	8.87	9.71	-14.0	-30.0	-11.9	39.2	36.0	36.5	0.23
921115	1600	0.47	0.113	0.103	8.87	9.71	6.0	6.0	2.7	38.7	36.9	37.7	0.20
921115	1900	0.59	0.220	0.113	4.54	8.87	52.0	54.0	25.8	63.4	25.2	40.3	0.22
921115	2200	0.68	0.250	0.103	4.01	9.71	52.0	52.0	27.6	50.3	20.1	37.3	0.24
921116	0100	1.17	0.191	0.191	5.24	5.24	44.0	48.0	39.7	21.3	19.2	12.3	0.18
921116	0400	1.14	0.171	0.171	5.83	5.83	30.0	48.0	35.0	24.3	20.8	17.4	0.12
921116	0700	1.11	0.162	0.171	6.19	5.83	26.0	42.0	36.8	23.6	21.5	12.4	0.12
921116	1000	0.98	0.162	0.171	6.19	5.83	26.0	42.0	28.9	26.5	22.9	20.7	0.15
921116	1300	0.88	0.171	0.162	5.83	6.19	32.0	32.0	29.3	28.2	22.9	20.0	0.15
921116	1600	0.71	0.171	0.171	5.83	5.83	42.0	40.0	20.7	43.5	23.9	16.0	0.13
921116	1900	0.66	0.191	0.181	5.24	5.52	40.0	40.0	20.7	47.8	25.1	19.0	0.14
921116	2200	0.60	0.113	0.113	8.87	8.87	-24.0	36.0	16.2	50.5	29.1	22.6	0.17
921117	0100	0.59	0.181	0.113	5.52	8.87	32.0	40.0	22.5	51.1	32.2	36.4	0.17
921117	0400	0.54	0.113	0.113	8.87	8.87	6.0	40.0	16.9	52.2	34.4	36.3	0.16
921117	0700	0.50	0.181	0.113	5.52	8.87	38.0	-10.0	8.0	49.1	39.6	34.5	0.18
921117	1000	0.51	0.113	0.113	8.87	8.87	6.0	6.0	-0.4	44.5	41.6	36.1	0.21
921117	1300	0.46	0.113	0.123	8.87	8.16	-28.0	-24.0	-15.2	40.1	41.6	37.4	0.23
921117	1600	0.43	0.113	0.113	8.87	8.87	-20.0	-22.0	-21.8	36.9	37.1	34.9	0.21
921117	1900	0.39	0.113	0.113	8.87	8.87	-14.0	-18.0	-23.4	34.3	32.5	31.8	0.19
921117	2200	0.35	0.113	0.113	8.87	8.87	-18.0	-38.0	-29.3	36.7	34.6	36.0	0.28
921118	0100	0.33	0.113	0.113	8.87	8.87	-28.0	-26.0	-27.7	31.8	31.4	28.5	0.26
921118	0400	0.31	0.113	0.113	8.87	8.87	-28.0	-26.0	-30.4	33.3	30.7	31.5	0.26
921118	0700	0.31	0.113	0.113	8.87	8.87	-24.0	-24.0	-27.8	32.5	31.8	31.4	0.22
921118	1000	0.33	0.113	0.113	8.87	8.87	-26.0	-24.0	-21.4	34.8	33.7	33.6	0.29
921118	1300	0.33	0.113	0.113	8.87	8.87	-24.0	-26.0	-28.0	38.8	35.9	34.8	0.28
921118	1600	0.36	0.113	0.113	8.87	8.87	-22.0	-24.0	-24.0	36.5	35.4	32.3	0.26
921118	1900	0.39	0.123	0.113	8.16	8.87	-22.0	-22.0	-22.0	37.8	36.4	35.8	0.20

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Table A1 (Continued)

Date	Time EST	H <sub>m</sub> m	f <sub>amb</sub> Hz	f <sub>amb</sub> Hz	T <sub>amb</sub> sec	T <sub>amb</sub> sec	θ <sub>amb</sub> deg	θ <sub>amb</sub> deg	θ <sub>amb</sub> deg	Δθ <sub>amb</sub> deg	Δθ <sub>amb</sub> deg	Δθ <sub>amb</sub> deg	X
921118	2200	0.41	0.113	0.113	8.87	8.87	-22.0	-22.0	-24.4	35.6	35.1	35.0	0.25
921119	0100	0.41	0.113	0.113	8.87	8.87	-26.0	-24.0	-22.5	38.0	37.2	37.1	0.25
921119	0400	0.41	0.113	0.113	8.87	8.87	-28.0	-26.0	-26.6	39.9	36.3	36.2	0.24
921119	0700	0.48	0.113	0.113	8.87	8.87	-24.0	-24.0	-14.2	39.6	33.9	35.7	0.20
921119	1000	0.69	0.240	0.123	4.17	8.16	4.0	6.0	-0.8	39.2	31.3	31.2	0.15
921119	1300	0.82	0.230	0.230	4.35	4.35	44.0	44.0	25.6	52.4	38.9	34.1	0.15
921119	1600	1.13	0.191	0.191	5.24	5.24	38.0	42.0	31.9	39.6	29.9	24.0	0.13
921119	1900	1.41	0.191	0.152	5.24	6.59	34.0	38.0	32.3	31.3	27.1	31.7	0.13
921119	2200	1.62	0.181	0.152	5.52	6.59	22.0	36.0	25.7	34.2	29.7	35.4	0.11
921120	0100	1.92	0.152	0.152	6.59	6.59	22.0	22.0	27.3	32.4	29.8	26.9	0.14
921120	0400	2.03	0.142	0.152	7.04	6.59	14.0	18.0	27.7	33.9	30.2	30.3	0.14
921120	0700	1.96	0.162	0.142	6.19	7.04	18.0	16.0	19.7	36.7	31.8	38.7	0.11
921120	1000	2.01	0.152	0.142	6.59	7.04	20.0	12.0	21.1	35.5	29.8	32.9	0.11
921120	1300	2.14	0.152	0.152	6.59	6.59	16.0	14.0	17.7	37.4	32.4	32.2	0.11
921120	1600	1.97	0.142	0.142	7.04	7.04	24.0	16.0	17.5	39.8	33.7	31.7	0.12
921120	1900	1.80	0.132	0.152	7.56	6.59	6.0	10.0	11.3	42.0	35.7	47.2	0.11
921120	2200	1.64	0.152	0.132	6.59	7.56	14.0	12.0	15.7	40.2	35.3	38.8	0.11
921121	0100	1.72	0.123	0.132	8.16	7.56	8.0	8.0	8.4	42.1	42.1	40.8	0.13
921121	0400	1.84	0.103	0.123	9.71	8.16	6.0	6.0	7.5	40.4	42.9	32.9	0.15
921121	0700	1.61	0.123	0.123	8.16	8.16	2.0	6.0	0.6	42.1	43.9	36.7	0.14
921121	1000	1.50	0.113	0.113	8.87	8.87	-38.0	4.0	-18.3	40.7	42.4	34.9	0.13
921121	1300	1.46	0.113	0.113	8.87	8.87	8.0	-22.0	-12.7	40.6	41.3	34.1	0.13
921121	1600	1.41	0.103	0.103	9.71	9.71	4.0	-38.0	-25.9	40.7	41.5	34.0	0.14
921121	1900	1.32	0.123	0.123	8.16	8.16	-30.0	4.0	-16.3	39.3	40.2	31.5	0.14
921121	2200	1.24	0.123	0.123	8.16	8.16	2.0	-40.0	-30.1	38.9	39.2	34.4	0.13
921122	0100	1.26	0.123	0.123	8.16	8.16	6.0	-40.0	-22.1	40.3	39.7	36.1	0.15
921122	0400	1.23	0.152	0.113	6.59	8.87	-46.0	-44.0	-34.9	41.2	38.5	36.9	0.19
921122	0700	1.13	0.113	0.113	8.87	8.87	-28.0	-46.0	-23.4	41.7	38.8	35.5	0.19
921122	1000	1.07	0.132	0.123	7.56	8.16	-46.0	-42.0	-33.6	39.7	37.5	36.2	0.15
921122	1300	1.03	0.142	0.113	7.04	8.87	-40.0	-42.0	-28.7	39.7	37.1	36.4	0.17
921122	1600	1.01	0.123	0.123	8.16	8.16	-44.0	-44.0	-29.1	40.2	36.5	35.9	0.21
921122	1900	0.93	0.142	0.113	7.04	8.87	-42.0	-44.0	-38.9	39.0	36.2	38.5	0.20
921122	2200	0.92	0.123	0.123	8.16	8.16	4.0	-42.0	-23.8	38.8	30.5	36.6	0.17
921123	0100	0.92	0.142	0.132	7.04	7.56	-40.0	-44.0	-30.4	35.5	30.1	36.4	0.20
921123	0400	0.96	0.142	0.132	7.04	7.56	-44.0	-44.0	-36.6	33.4	29.5	30.5	0.23
921123	0700	0.90	0.132	0.113	7.56	8.87	-44.0	-46.0	-34.8	36.7	30.5	35.4	0.21
921123	1000	0.85	0.132	0.113	7.56	8.87	-42.0	-44.0	-34.4	33.7	29.4	37.4	0.17
921123	1300	0.84	0.113	0.113	8.87	8.87	-26.0	-44.0	-38.8	31.2	28.8	29.5	0.16
921123	1600	0.86	0.123	0.123	8.16	8.16	-32.0	-46.0	-39.8	31.6	28.2	26.5	0.19
921123	1900	0.82	0.113	0.113	8.87	8.87	-30.0	-46.0	-40.2	33.3	28.3	33.9	0.18
921123	2200	0.71	0.123	0.123	8.16	8.16	-44.0	-46.0	-40.3	34.4	29.3	35.7	0.15
921124	0100	0.64	0.123	0.113	8.16	8.87	-30.0	-44.0	-26.4	38.2	34.1	30.8	0.18
921124	0400	0.83	0.123	0.113	8.16	8.87	-28.0	-46.0	-3.1	71.5	40.3	35.1	0.18
921124	0700	0.97	0.230	0.240	4.35	4.17	24.0	24.0	6.8	65.6	34.7	38.4	0.15
921124	1000	0.90	0.220	0.240	4.54	4.17	14.0	10.0	3.5	61.5	33.8	34.4	0.14
921124	1300	0.89	0.220	0.113	4.54	8.87	36.0	38.0	5.5	60.4	34.3	34.5	0.13
921124	1600	1.03	0.230	0.230	4.35	4.35	46.0	22.0	6.4	56.8	38.1	34.6	0.12
921124	1900	1.14	0.210	0.210	4.75	4.75	24.0	22.0	7.4	49.8	36.2	24.8	0.12
921124	2200	1.09	0.191	0.191	5.24	5.24	12.0	12.0	3.8	48.8	38.3	21.6	0.14
921125	0100	1.10	0.171	0.171	5.83	5.83	22.0	16.0	8.0	51.2	39.9	21.5	0.13
921125	0400	1.13	0.171	0.171	5.83	5.83	20.0	16.0	5.8	51.8	48.1	38.1	0.16
921125	0700	1.06	0.162	0.152	6.19	6.59	16.0	18.0	9.0	54.4	51.5	44.4	0.20
921125	1000	1.01	0.162	0.162	7.04	6.19	10.0	12.0	10.5	57.2	55.6	62.4	0.17
921125	1300	0.98	0.152	0.162	6.59	6.19	8.0	10.0	9.6	51.5	48.6	50.9	0.14
921125	1600	1.10	0.083	0.093	11.98	10.72	14.0	14.0	2.7	41.9	44.0	30.4	0.19
921125	1900	1.19	0.083	0.083	11.98	11.98	16.0	8.0	5.2	37.6	39.6	30.4	0.20
921125	2200	1.16	0.083	0.083	11.98	11.98	18.0	10.0	8.9	36.6	40.4	32.6	0.20

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{a,ms}$ Hz	$T_{s,ms}$ sec	$T_{a,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{a,ms}$ deg	$\theta_{s,mv}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{mv}$ deg	$\Delta\theta_{mp}$ deg	$x$
921126	0100	1.22	0.083	0.083	11.98	11.98	-12.0	-10.0	-16.4	32.8	37.5	30.6	0.15
921126	0400	1.29	0.074	0.083	13.56	11.98	-10.0	-10.0	-18.0	33.5	34.9	33.0	0.17
921126	0700	1.23	0.074	0.083	13.56	11.98	-12.0	-10.0	-13.3	38.3	30.7	32.5	0.19
921126	1000	1.06	0.074	0.083	13.56	11.98	-10.0	-8.0	-13.4	41.8	36.0	34.4	0.21
921126	1300	1.05	0.083	0.083	11.98	11.98	-2.0	6.0	-16.5	40.5	35.1	32.6	0.15
921126	1600	1.06	0.074	0.083	13.56	11.98	-10.0	-10.0	-25.5	43.3	36.8	29.2	0.16
921126	1900	1.04	0.142	0.083	7.04	11.98	-46.0	-44.0	-19.2	50.0	38.2	31.7	0.19
921126	2200	0.96	0.132	0.093	7.56	10.72	-46.0	-46.0	-34.1	47.7	32.1	35.6	0.19
921127	0100	0.93	0.142	0.093	7.04	10.72	-44.0	-44.0	-28.0	45.5	28.5	34.6	0.15
921127	0400	0.97	0.142	0.093	7.04	10.72	-44.0	-44.0	-28.6	43.0	26.2	35.2	0.17
921127	0700	1.06	0.064	0.093	15.63	10.72	-12.0	-48.0	-0.1	75.6	34.9	38.5	0.20
921127	1000	1.56	0.191	0.201	5.24	4.98	44.0	50.0	32.1	42.8	33.6	30.2	0.14
921127	1300	1.93	0.162	0.162	6.19	6.19	20.0	44.0	30.8	35.7	31.8	26.3	0.13
921127	1600	1.88	0.162	0.152	6.19	6.59	18.0	18.0	17.5	41.2	37.2	40.8	0.12
921127	1900	1.70	0.162	0.162	6.19	6.19	18.0	20.0	19.8	46.7	37.3	31.1	0.13
921127	2200	1.57	0.162	0.162	6.19	6.19	38.0	26.0	25.7	46.1	35.7	26.8	0.14
921128	0100	1.45	0.162	0.171	6.19	5.83	22.0	56.0	18.4	51.5	31.9	25.5	0.15
921128	0400	1.33	0.171	0.171	5.83	5.83	24.0	22.0	22.0	45.5	30.0	21.7	0.13
921128	0700	1.26	0.162	0.162	6.19	6.19	14.0	16.0	20.2	44.8	33.5	23.4	0.14
921128	1000	1.12	0.162	0.162	6.19	6.19	14.0	12.0	12.8	44.7	33.5	29.0	0.19
921128	1300	1.03	0.171	0.171	5.83	5.83	16.0	10.0	13.6	42.4	32.3	24.2	0.17
921128	1600	0.98	0.171	0.113	5.83	8.87	16.0	10.0	12.2	41.2	29.2	34.6	0.16
921128	1900	0.98	0.113	0.113	8.87	8.87	6.0	10.0	8.1	44.1	32.0	38.2	0.16
921128	2200	0.89	0.113	0.113	8.87	8.87	10.0	12.0	8.0	43.3	31.1	35.4	0.20
921129	0100	0.82	0.171	0.113	5.83	8.87	14.0	14.0	7.6	45.0	32.6	42.1	0.19
921129	0400	0.88	0.113	0.113	8.87	8.87	-40.0	18.0	8.3	43.8	29.0	40.3	0.16
921129	0700	0.93	0.171	0.171	5.83	5.83	12.0	16.0	16.7	39.1	28.4	22.9	0.18
921129	1000	0.86	0.171	0.123	5.83	8.16	14.0	14.0	14.6	41.9	30.3	37.8	0.20
921129	1300	0.80	0.181	0.113	5.52	8.87	18.0	14.0	13.0	43.8	29.8	36.4	0.19
921129	1600	0.75	0.113	0.113	8.87	8.87	8.0	12.0	10.8	44.5	30.8	36.1	0.18
921129	1900	0.67	0.113	0.113	8.87	8.87	-10.0	8.0	7.1	42.8	29.3	31.9	0.20
921129	2200	0.61	0.113	0.113	8.87	8.87	-6.0	16.0	1.9	44.5	30.2	32.4	0.22
921130	0100	0.58	0.113	0.113	8.87	8.87	-10.0	18.0	6.9	45.9	29.1	30.6	0.22
921130	0400	0.51	0.181	0.103	5.52	9.71	18.0	18.0	7.7	45.8	28.2	37.8	0.20
921130	0700	0.51	0.103	0.103	9.71	9.71	-34.0	18.0	7.9	51.0	30.4	36.5	0.22
921130	1000	0.47	0.103	0.103	9.71	9.71	-28.0	20.0	7.5	51.3	31.3	39.5	0.22
921130	1300	0.45	0.074	0.103	13.56	9.71	-10.0	44.0	4.2	53.1	31.1	39.8	0.22
921130	1600	0.45	0.210	0.103	4.75	9.71	28.0	26.0	1.7	52.9	29.3	36.1	0.17
921130	1900	0.40	0.103	0.103	9.71	9.71	-26.0	24.0	-2.4	54.5	30.4	35.8	0.23
921130	2200	0.37	0.103	0.103	9.71	9.71	-26.0	-26.0	-7.8	47.9	38.7	38.7	0.22
921201	0100	0.35	0.103	0.103	9.71	9.71	-40.0	-30.0	-19.4	42.5	44.1	37.4	0.23
921201	0400	0.35	0.103	0.103	9.71	9.71	-38.0	-40.0	-28.4	38.8	39.9	33.1	0.23
921201	0700	0.36	0.103	0.113	9.71	8.87	-40.0	-40.0	-31.6	38.0	40.7	33.7	0.20
921201	1000	0.38	0.113	0.113	8.87	8.87	-26.0	-28.0	-29.1	35.6	35.0	30.0	0.23
921201	1600	0.43	0.318	0.103	3.15	9.71	66.0	64.0	18.6	85.3	23.2	31.0	0.27
921201	1900	0.69	0.240	0.240	4.17	4.17	52.0	60.0	41.0	18.3	17.2	12.9	0.25
921201	2200	0.62	0.240	0.240	4.17	4.17	58.0	58.0	41.4	18.5	17.7	13.6	0.23
921202	0100	0.51	0.259	0.259	3.86	3.86	58.0	54.0	35.1	38.2	19.4	9.5	0.21
921202	0400	0.46	0.201	0.103	4.98	9.71	48.0	52.0	24.3	58.6	24.6	43.4	0.20
921202	0700	0.39	0.240	0.103	4.17	9.71	58.0	58.0	6.1	74.2	30.8	39.1	9.99
921202	1000	0.35	0.113	0.113	8.87	8.87	-40.0	-42.0	-15.8	52.8	43.5	34.9	9.99
921202	1300	0.35	0.054	0.113	18.45	8.87	-8.0	-46.0	-33.4	54.0	43.6	43.5	0.30
921202	1600	0.31	0.054	0.054	18.45	18.45	-8.0	-8.0	-25.5	43.5	40.4	22.2	9.99
921202	1900	0.30	0.064	0.064	15.63	15.63	-10.0	-10.0	-15.7	38.2	36.0	20.3	0.33
921202	2200	0.30	0.064	0.064	15.63	15.63	-10.0	-10.0	-7.2	40.7	33.6	15.8	0.41
921203	0100	0.31	0.123	0.064	8.16	15.63	-44.0	-44.0	-3.4	61.0	25.6	22.0	0.41
921203	0400	0.32	0.250	0.064	4.01	15.63	60.0	58.0	7.5	69.1	23.5	16.6	0.27
921203	0700	0.36	0.064	0.064	15.63	15.63	-12.0	58.0	8.7	68.1	23.0	19.6	0.25

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Table A1 (Continued)														
Date	Time EST	$N_{ms}$ m	$f_{s,ms}$ Hz	$f_{a,ms}$ Hz	$T_{s,ms}$ sec	$T_{a,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{a,ms}$ deg	$\theta_{p,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{av}$ deg	$\Delta\theta_{mv}$ deg	$x$	
921203	1000	0.34	0.064	0.064	15.63	15.63	-10.0	60.0	3.6	71.1	25.1	13.5	0.32	
921203	1300	0.36	0.240	0.064	4.17	15.63	62.0	62.0	10.0	72.7	25.9	16.1	9.99	
921203	1600	0.35	0.240	0.064	4.17	15.63	60.0	58.0	3.3	71.1	30.0	18.6	0.22	
921203	1900	0.33	0.240	0.064	4.17	15.63	58.0	56.0	11.5	63.0	27.8	19.2	0.20	
921203	2200	0.34	0.201	0.064	4.98	15.63	46.0	46.0	13.0	58.6	25.1	20.8	0.21	
921204	0100	0.35	0.220	0.220	4.54	4.54	48.0	48.0	18.1	56.9	21.2	8.4	0.28	
921204	0400	0.34	0.240	0.064	4.17	15.63	48.0	44.0	11.9	50.7	23.1	16.7	0.26	
921204	0700	0.40	0.181	0.181	5.52	5.52	34.0	34.0	20.7	45.0	20.9	9.9	0.17	
921204	1000	0.41	0.171	0.181	5.83	5.52	36.0	36.0	18.4	44.5	24.0	9.9	9.99	
921204	1300	0.43	0.152	0.142	6.59	7.04	22.0	20.0	14.9	35.1	28.4	19.4	0.23	
921204	1600	0.41	0.103	0.103	9.71	9.71	20.0	18.0	12.0	33.0	31.7	26.8	0.25	
921204	1900	0.41	0.093	0.093	10.72	10.72	-6.0	2.0	-1.6	28.7	29.3	25.3	0.20	
921204	2200	0.39	0.093	0.093	10.72	10.72	18.0	-2.0	-1.8	34.2	29.8	25.8	0.21	
921205	0100	0.38	0.093	0.093	10.72	10.72	-8.0	-10.0	-16.4	29.4	27.9	23.0	0.33	
921205	0400	0.35	0.083	0.083	11.98	11.98	-10.0	-12.0	-12.7	30.4	24.7	22.5	0.30	
921205	0700	0.30	0.083	0.083	11.98	11.98	-10.0	-10.0	-21.0	37.3	25.9	26.1	0.26	
921205	1000	0.41	0.240	0.250	4.17	4.01	66.0	64.0	25.7	78.0	17.7	11.8	0.17	
921205	1300	1.05	0.181	0.181	5.52	5.52	52.0	50.0	50.0	12.6	11.3	7.6	0.11	
921205	1600	1.38	0.152	0.152	6.59	6.59	42.0	44.0	45.5	12.1	10.0	6.7	0.11	
921205	1900	1.23	0.171	0.171	5.83	5.83	44.0	46.0	42.2	18.4	10.3	7.3	0.10	
921205	2200	1.21	0.171	0.171	5.83	5.83	48.0	48.0	42.6	20.8	11.0	7.4	0.09	
921206	0100	1.45	0.162	0.142	6.19	7.04	42.0	44.0	41.7	20.0	12.2	10.5	0.12	
921206	0400	1.46	0.142	0.152	7.04	6.59	36.0	42.0	41.6	21.5	12.9	11.6	0.13	
921206	0700	1.15	0.142	0.142	7.04	7.04	34.0	34.0	37.3	22.1	14.7	8.3	0.10	
921206	1000	1.02	0.142	0.142	7.04	7.04	24.0	24.0	29.2	28.9	15.4	10.0	0.09	
921206	1300	1.02	0.103	0.113	9.71	8.87	-2.0	28.0	27.3	27.7	18.3	20.1	0.10	
921206	1600	0.75	0.142	0.142	7.04	7.04	26.0	26.0	29.0	22.9	18.7	9.0	0.14	
921206	1900	0.57	0.142	0.142	7.04	7.04	26.0	26.0	24.5	29.7	21.0	10.9	0.13	
921206	2200	0.42	0.132	0.132	7.56	7.56	24.0	18.0	17.0	37.0	30.3	25.9	0.13	
921207	0100	0.34	0.142	0.142	7.04	7.04	20.0	-8.0	-2.0	36.3	35.2	44.9	0.22	
921207	0400	0.29	0.083	0.083	11.98	11.98	-8.0	-8.0	-19.3	34.0	31.1	20.2	0.24	
921207	0700	0.26	0.074	0.083	13.56	11.98	-2.0	-4.0	-11.0	31.5	32.7	24.1	0.26	
921207	1000	0.27	0.083	0.083	11.98	11.98	-8.0	-8.0	-9.2	22.9	26.9	18.4	0.24	
921207	1300	0.31	0.083	0.083	11.98	11.98	-8.0	-8.0	-6.9	25.8	27.7	22.1	0.24	
921207	1600	0.51	0.220	0.230	4.54	4.35	58.0	58.0	33.8	62.1	21.5	18.1	0.15	
921207	1900	0.58	0.220	0.240	4.54	4.17	52.0	54.0	40.3	37.9	22.4	20.3	0.11	
921207	2200	0.87	0.181	0.210	5.52	4.75	36.0	36.0	37.4	20.2	14.7	12.7	0.08	
921208	0100	0.98	0.181	0.181	5.52	5.52	42.0	42.0	40.1	18.6	16.5	12.6	0.09	
921208	0400	0.96	0.162	0.162	6.19	6.19	34.0	36.0	39.2	24.3	20.7	13.9	0.11	
921208	0700	1.00	0.171	0.162	5.83	6.19	36.0	34.0	37.4	21.6	19.1	14.3	0.09	
921208	1000	0.88	0.181	0.181	5.52	5.52	44.0	42.0	38.6	25.4	19.6	15.5	0.08	
921208	1300	0.92	0.162	0.171	6.19	5.83	24.0	22.0	32.7	26.4	19.6	17.6	0.08	
921208	1600	0.92	0.152	0.181	6.59	5.52	22.0	24.0	32.3	26.2	19.8	18.3	0.10	
921208	1900	1.06	0.201	0.210	4.98	4.75	44.0	34.0	34.9	26.0	19.0	17.4	0.11	
921208	2200	1.08	0.201	0.191	4.98	5.24	40.0	40.0	34.5	26.8	18.6	16.1	0.10	
921209	0100	1.19	0.191	0.191	5.24	5.24	42.0	44.0	35.6	29.4	20.4	16.3	0.12	
921209	0400	1.30	0.191	0.191	5.24	5.24	34.0	30.0	31.2	31.7	20.8	17.4	0.13	
921209	0700	1.36	0.171	0.171	5.83	5.83	32.0	30.0	26.6	27.9	19.8	15.1	0.09	
921209	1000	1.42	0.162	0.162	6.19	6.19	28.0	24.0	24.8	25.0	20.6	15.6	0.08	
921209	1300	1.51	0.152	0.142	6.59	7.04	24.0	24.0	22.6	26.6	22.8	19.9	0.08	
921209	1600	1.33	0.162	0.142	6.19	7.04	26.0	24.0	24.2	27.3	22.6	19.5	0.09	
921209	1900	1.11	0.152	0.152	6.59	6.59	26.0	26.0	24.9	26.6	21.0	13.2	0.10	
921209	2200	0.96	0.181	0.162	5.52	6.19	28.0	36.0	20.3	38.3	25.1	21.5	0.08	
921210	0100	0.96	0.132	0.220	7.56	4.54	-14.0	-14.0	13.9	40.8	32.8	36.4	0.08	
921210	0400	0.95	0.210	0.210	4.75	4.75	18.0	18.0	17.4	37.4	30.4	26.0	0.10	
921210	0700	0.99	0.210	0.210	4.75	4.75	18.0	-18.0	-1.2	54.1	52.0	61.0	0.10	
921210	1000	1.83	0.152	0.152	6.59	6.59	-42.0	-42.0	-38.8	29.1	28.5	23.8	0.08	
921210	1300	2.49	0.142	0.132	7.04	7.56	-38.0	-40.0	-32.2	28.3	27.7	24.3	0.11	

(Sheet 14 of 47)

Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{s,0}$ Hz	$f_{s,0}$ Hz	$T_{s,0}$ sec	$T_{s,0}$ sec	$\theta_{s,0}$ deg	$\theta_{s,0}$ deg	$\theta_{s,0}$ deg	$\Delta\theta_{s,0}$ deg	$\Delta\theta_{s,0}$ deg	$\Delta\theta_{s,0}$ deg	$\chi$
921210	1600	3.36	0.113	0.113	8.87	8.87	-16.0	-24.0	-25.4	25.6	26.0	21.5	0.19
921210	1900	3.53	0.093	0.093	10.72	10.72	-34.0	-26.0	-27.0	22.8	23.2	17.3	0.21
921210	2200	3.02	0.083	0.083	11.98	11.98	-34.0	-26.0	-30.4	22.2	21.6	20.0	0.20
921211	0100	2.21	0.083	0.083	11.98	11.98	-32.0	-30.0	-28.0	24.0	23.5	23.8	0.14
921211	0400	2.16	0.083	0.083	11.98	11.98	-22.0	-22.0	-23.7	26.8	22.3	19.9	0.12
921211	0700	2.00	0.083	0.083	11.98	11.98	-30.0	-26.0	-29.5	33.1	28.7	30.6	0.12
921211	1000	1.58	0.083	0.083	11.98	11.98	-22.0	-22.0	-22.6	33.3	25.8	22.4	0.12
921211	1300	1.40	0.083	0.083	11.98	11.98	-22.0	-20.0	-23.3	28.6	25.9	23.7	0.12
921211	1600	1.23	0.093	0.083	10.72	11.98	-22.0	-22.0	-14.2	28.8	25.2	25.1	0.12
921211	1900	1.27	0.093	0.083	10.72	11.98	-20.0	-18.0	-15.7	29.4	24.8	28.2	0.15
921211	2200	1.15	0.093	0.093	10.72	10.72	-22.0	-20.0	-15.3	32.6	28.1	25.6	0.17
921212	0100	1.38	0.074	0.083	13.56	11.98	4.0	4.0	-6.1	30.1	26.2	26.7	0.13
921212	0400	1.49	0.074	0.083	13.56	11.98	2.0	2.0	-1.7	31.0	24.0	22.5	0.12
921212	0700	2.12	0.083	0.083	11.98	11.98	10.0	52.0	27.2	49.7	18.9	19.9	0.17
921212	1000	2.54	0.171	0.083	5.83	11.98	46.0	50.0	30.5	35.5	17.7	18.9	0.19
921212	1300	2.73	0.083	0.083	11.98	11.98	10.0	12.0	23.4	31.4	20.2	18.7	0.15
921212	1600	2.69	0.083	0.083	11.98	11.98	12.0	10.0	21.3	28.5	22.6	18.9	0.13
921212	1900	2.90	0.083	0.083	11.98	11.98	-2.0	8.0	18.5	30.5	21.9	14.3	0.13
921212	2200	3.07	0.074	0.074	13.56	13.56	-2.0	14.0	23.7	30.1	22.2	18.9	0.14
921213	0100	3.20	0.074	0.074	13.56	13.56	-2.0	12.0	19.6	30.3	23.1	15.9	0.15
921213	0400	3.12	0.074	0.074	13.56	13.56	2.0	6.0	20.5	30.2	24.3	18.2	0.15
921213	0700	3.41	0.074	0.074	13.56	13.56	0.0	12.0	22.0	34.7	24.7	19.5	0.18
921213	1000	3.40	0.074	0.074	13.56	13.56	2.0	6.0	22.3	33.4	22.9	16.7	0.19
921213	1300	3.31	0.074	0.074	13.56	13.56	2.0	2.0	17.5	30.0	24.9	23.0	0.16
921213	1600	3.36	0.074	0.074	13.56	13.56	-2.0	0.0	9.8	25.1	25.0	17.2	0.13
921213	1900	3.79	0.064	0.074	15.63	13.56	0.0	0.0	6.8	24.0	25.8	19.5	0.14
921213	2200	3.90	0.074	0.064	13.56	15.63	-2.0	0.0	10.6	25.0	26.5	20.3	0.16
921214	0100	4.00	0.064	0.064	15.63	15.63	0.0	0.0	-0.1	19.9	22.0	18.0	0.13
921214	0400	3.88	0.064	0.064	15.63	15.63	-4.0	-2.0	-1.6	20.9	21.8	16.0	0.11
921214	0700	4.08	0.064	0.064	15.63	15.63	-4.0	-2.0	-2.5	21.5	23.6	19.8	0.11
921214	1000	4.26	0.054	0.064	18.45	15.63	-4.0	-4.0	-4.3	21.8	23.3	22.1	0.12
921214	1300	4.16	0.064	0.064	15.63	15.63	-2.0	-2.0	-2.5	20.7	21.3	22.0	0.11
921214	1600	4.00	0.054	0.064	18.45	15.63	-2.0	-2.0	-2.6	17.8	18.0	19.3	0.11
921214	1900	4.04	0.064	0.064	15.63	15.63	-14.0	-4.0	-6.3	16.5	16.6	14.9	0.12
921214	2200	3.91	0.064	0.064	15.63	15.63	-14.0	-6.0	-8.2	18.7	18.3	18.3	0.12
921215	0100	3.83	0.064	0.064	15.63	15.63	0.0	-4.0	-4.6	18.3	18.5	19.8	0.12
921215	0400	3.63	0.064	0.064	15.63	15.63	-12.0	-6.0	-5.1	18.6	18.2	18.3	0.12
921215	0700	3.66	0.064	0.064	15.63	15.63	-6.0	-6.0	-5.1	17.1	17.1	17.6	0.11
921215	1000	3.21	0.064	0.064	15.63	15.63	-4.0	-6.0	-5.7	18.4	18.5	20.4	0.13
921215	1300	2.84	0.064	0.064	15.63	15.63	-8.0	-6.0	-5.9	17.4	17.4	14.3	0.12
921215	1600	2.64	0.064	0.064	15.63	15.63	-6.0	-6.0	-6.7	18.4	19.2	16.3	0.12
921215	1900	2.65	0.064	0.064	15.63	15.63	-10.0	-10.0	-9.2	16.2	18.4	10.1	0.11
921215	2200	2.35	0.074	0.074	13.56	13.56	0.0	-2.0	-6.3	19.5	22.9	17.1	0.15
921216	0100	2.02	0.074	0.074	13.56	13.56	-6.0	-6.0	-6.9	16.8	16.8	14.2	0.16
921216	0400	1.95	0.074	0.074	13.56	13.56	-2.0	-6.0	-7.2	18.2	18.2	18.7	0.13
921216	0700	2.04	0.074	0.074	13.56	13.56	-10.0	-12.0	-11.7	17.0	17.3	16.1	0.11
921216	1000	2.05	0.064	0.074	15.63	13.56	-12.0	-12.0	-11.8	18.2	18.4	19.6	0.13
921216	1300	1.81	0.064	0.074	15.63	13.56	-14.0	-12.0	-9.9	19.7	19.7	19.5	0.15
921216	1600	1.67	0.074	0.074	13.56	13.56	-10.0	-10.0	-13.0	20.1	20.1	19.8	0.14
921216	1900	1.64	0.074	0.074	13.56	13.56	-8.0	-10.0	-12.3	18.9	18.7	14.5	0.11
921216	2200	1.57	0.074	0.074	13.56	13.56	-16.0	-16.0	-12.9	19.5	19.7	18.0	0.13
921217	0100	1.54	0.074	0.074	13.56	13.56	-16.0	-12.0	-14.6	21.7	23.3	19.5	0.17
921217	0400	1.40	0.074	0.074	13.56	13.56	-14.0	-16.0	-15.3	22.4	23.1	19.5	0.15
921217	0700	1.39	0.074	0.074	13.56	13.56	-18.0	-18.0	-16.7	20.8	22.1	19.9	0.13
921217	1000	1.39	0.074	0.074	13.56	13.56	-12.0	-14.0	-19.2	23.0	21.2	17.1	0.13
921217	1300	1.27	0.074	0.074	13.56	13.56	-12.0	-12.0	-18.7	25.4	21.6	17.0	0.16
921217	1600	1.15	0.074	0.083	13.56	11.98	-14.0	-14.0	-21.0	26.7	21.8	22.5	0.15
921217	1900	1.00	0.083	0.083	11.98	11.98	-12.0	-12.0	-21.7	30.2	22.9	23.9	0.14

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{A/B}$ Hz	$f_{B/B}$ Hz	$T_{A/B}$ sec	$T_{B/B}$ sec	$\theta_{A/B}$ deg	$\theta_{B/B}$ deg	$\theta_{A/B}$ deg	$\Delta\theta_{AB}$ deg	$\Delta\theta_{BB}$ deg	$\Delta\theta_{BP}$ deg	$X$
921217	2200	0.91	0.083	0.083	11.98	11.98	-16.0	-14.0	-17.0	28.5	27.0	24.0	0.16
921218	0100	0.97	0.083	0.083	11.98	11.98	-10.0	-12.0	9.0	52.5	27.8	21.9	0.19
921218	0400	0.88	0.083	0.083	11.98	11.98	-10.0	-12.0	6.6	49.5	26.8	23.4	0.19
921218	0700	0.81	0.093	0.083	10.72	11.98	-8.0	-8.0	7.0	43.6	29.6	26.5	0.16
921218	1000	1.09	0.181	0.093	5.52	10.72	22.0	18.0	16.8	33.1	24.5	24.0	0.12
921218	1300	1.26	0.152	0.152	6.59	6.59	16.0	16.0	16.5	28.6	25.6	14.2	0.12
921218	1600	1.18	0.152	0.162	6.59	6.19	14.0	16.0	19.7	27.0	24.5	14.0	0.11
921218	1900	1.08	0.152	0.152	6.59	6.59	14.0	16.0	14.0	28.6	26.6	11.7	0.12
921218	2200	1.03	0.152	0.152	6.59	6.59	20.0	20.0	15.8	30.4	25.2	12.4	0.13
921219	0100	0.95	0.162	0.162	6.19	6.19	18.0	20.0	13.4	35.7	28.9	12.0	0.14
921219	0400	0.87	0.162	0.162	6.19	6.19	20.0	16.0	13.1	42.1	33.5	19.5	0.15
921219	0700	0.81	0.123	0.210	8.16	4.75	-24.0	-4.0	11.2	42.9	34.0	32.3	0.15
921219	1000	0.74	0.123	0.103	8.16	9.71	-26.0	0.0	5.0	44.3	33.9	20.1	0.16
921219	1300	0.66	0.083	0.093	11.98	10.72	-14.0	-12.0	5.7	47.0	42.9	26.8	0.17
921219	1600	0.64	0.103	0.093	9.71	10.72	-16.0	-12.0	2.7	51.8	51.3	27.1	0.21
921219	1900	0.66	0.093	0.093	10.72	10.72	-18.0	-18.0	-20.1	46.9	51.3	23.8	0.18
921219	2200	0.72	0.103	0.181	9.71	5.52	-14.0	-16.0	-20.8	42.6	41.0	28.1	0.16
921220	0100	0.80	0.171	0.171	5.83	5.83	-50.0	-30.0	-33.0	38.4	35.5	25.7	0.14
921220	0400	0.81	0.162	0.162	6.19	6.19	-26.0	-28.0	-32.5	34.7	32.9	27.3	0.16
921220	0700	0.77	0.152	0.152	6.59	6.59	-44.0	-44.0	-38.4	30.2	23.1	16.3	0.15
921220	1000	0.68	0.152	0.162	6.59	6.19	-42.0	-42.0	-37.5	32.6	23.3	16.7	0.13
921220	1300	0.58	0.152	0.152	6.59	6.59	-42.0	-42.0	-38.9	32.9	20.8	10.9	0.16
921220	1600	0.52	0.142	0.152	7.04	6.59	-42.0	-44.0	-40.2	28.8	19.3	13.1	0.18
921220	1900	0.44	0.142	0.142	7.04	7.04	-40.0	-40.0	-36.9	30.7	21.2	8.0	0.20
921220	2200	0.39	0.142	0.142	7.04	7.04	-40.0	-42.0	-26.9	39.0	29.3	6.5	0.20
921221	0100	1.44	0.191	0.181	5.24	5.52	48.0	52.0	44.0	27.3	23.0	22.5	0.12
921221	0400	1.70	0.171	0.162	5.83	6.19	48.0	46.0	44.5	23.5	22.1	17.5	0.13
921221	0700	1.37	0.162	0.162	6.19	6.19	44.0	46.0	39.7	24.6	22.3	19.5	0.10
921221	1000	1.35	0.132	0.142	7.56	7.04	12.0	20.0	29.2	25.9	21.8	15.3	0.08
921221	1300	1.17	0.142	0.142	7.04	7.04	18.0	20.0	26.7	25.9	24.6	15.6	0.10
921221	1600	0.95	0.152	0.152	6.59	6.59	22.0	22.0	24.6	29.0	25.5	11.9	0.13
921222	1000	0.57	0.093	0.093	10.72	10.72	-32.0	-34.0	-7.6	40.1	35.7	22.2	0.15
921222	1300	0.57	0.103	0.103	9.71	9.71	-28.0	-28.0	-19.4	31.8	33.4	19.2	0.14
921222	1600	0.56	0.103	0.103	9.71	9.71	-32.0	-32.0	-30.2	32.2	34.1	21.8	0.18
921222	1900	0.49	0.103	0.103	9.71	9.71	-30.0	-10.0	-22.0	32.7	34.3	24.7	0.22
921222	2200	0.49	0.103	0.103	9.71	9.71	-20.0	-18.0	-25.5	34.9	34.3	25.9	0.20
921223	0100	0.54	0.103	0.103	9.71	9.71	-24.0	-24.0	-31.6	32.7	28.6	25.7	0.18
921223	0400	0.56	0.103	0.103	9.71	9.71	-36.0	-22.0	-36.3	30.3	28.3	31.4	0.20
921223	0700	0.53	0.162	0.113	6.19	8.87	-44.0	-20.0	-27.3	28.5	25.5	23.9	0.20
921223	1000	0.45	0.113	0.113	8.87	8.87	-26.0	-22.0	-30.6	30.0	28.2	23.7	0.23
921223	1300	0.40	0.113	0.113	8.87	8.87	-20.0	-22.0	-29.9	31.0	26.3	28.7	0.22
921223	1600	0.40	0.113	0.113	8.87	8.87	-16.0	-24.0	-38.0	37.4	26.8	24.0	0.21
921223	1900	0.39	0.162	0.113	6.19	8.87	-56.0	-58.0	-46.8	40.6	24.2	22.1	0.21
921223	2200	0.37	0.132	0.132	7.56	7.56	-42.0	-42.0	-45.6	38.8	19.4	4.6	0.25
921224	0100	0.37	0.132	0.132	7.56	7.56	-42.0	-42.0	-42.2	39.9	21.5	8.5	0.26
921224	0400	0.35	0.132	0.132	7.56	7.56	-46.0	-62.0	-45.6	47.4	26.6	29.9	0.23
921224	0700	0.30	0.064	0.074	15.63	13.56	-10.0	-12.0	-44.6	50.1	35.7	26.4	0.23
921224	1000	0.76	0.298	0.298	3.35	3.35	48.0	50.0	43.0	8.7	9.1	5.8	0.37
921224	1300	1.68	0.152	0.162	6.59	6.19	40.0	46.0	45.1	13.4	11.7	7.6	9.99
921224	2200	1.31	0.152	0.123	6.59	8.16	28.0	26.0	31.5	26.4	18.3	16.2	0.18
921225	0100	1.15	0.142	0.142	7.04	7.04	22.0	24.0	24.5	26.0	21.0	14.1	0.12
921225	0400	1.12	0.103	0.103	9.71	9.71	-6.0	12.0	19.8	27.2	24.6	21.3	0.14
921225	0700	0.95	0.132	0.113	7.56	8.87	20.0	18.0	19.3	27.7	25.7	24.0	0.18
921225	1000	0.83	0.123	0.123	8.16	8.16	10.0	22.0	23.1	33.4	27.8	25.2	0.18
921225	1300	0.79	0.132	0.132	7.56	7.56	10.0	12.0	16.1	32.1	27.1	20.8	0.12
921225	1600	0.76	0.152	0.152	6.59	6.59	14.0	14.0	11.9	30.8	25.8	17.8	0.14
921225	1900	0.66	0.152	0.152	6.59	6.59	14.0	16.0	10.4	33.8	30.0	16.5	0.19

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{A/B}$ Hz	$f_{A/P}$ Hz	$T_{A/B}$ sec	$T_{A/P}$ sec	$\theta_{A/B}$ deg	$\theta_{A/P}$ deg	$\theta_{A/W}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{wp}$ deg	$\Delta\theta_{wp}$ deg	$X$
921225	2200	0.51	0.171	0.093	5.83	10.72	20.0	18.0	4.7	38.9	37.5	30.3	0.21
921226	0100	0.45	0.093	0.103	10.72	9.71	-12.0	-24.0	-24.5	37.1	38.2	29.0	0.17
921226	0400	0.43	0.201	0.113	4.98	8.87	-48.0	-48.0	-32.0	35.5	27.8	23.6	0.18
921226	0700	0.34	0.083	0.083	11.98	11.98	-14.0	-14.0	-28.2	31.4	26.0	14.3	0.20
921226	1000	0.34	0.083	0.083	11.98	11.98	-16.0	-12.0	1.2	48.1	28.4	20.6	0.25
921226	1300	0.56	0.259	0.259	3.86	3.86	90.0	90.0	50.5	68.5	27.9	27.7	0.25
921226	1600	0.71	0.269	0.240	3.72	4.17	90.0	90.0	53.2	42.6	34.7	34.2	0.21
921226	1900	0.80	0.132	0.201	7.56	4.98	14.0	30.0	40.7	37.4	27.6	21.8	0.18
921226	2200	1.15	0.181	0.181	5.52	5.52	40.0	40.0	40.4	30.5	23.6	19.2	0.16
921227	0100	1.62	0.142	0.162	7.04	6.19	22.0	26.0	36.6	25.0	21.7	16.6	0.15
921227	0400	1.59	0.171	0.152	5.83	6.59	44.0	42.0	38.1	26.8	24.4	21.5	0.14
921227	0700	1.38	0.162	0.162	6.19	6.19	40.0	40.0	33.8	28.2	28.4	19.4	0.14
921227	1000	1.15	0.162	0.162	6.19	6.19	38.0	38.0	37.7	31.0	29.7	22.4	0.13
921227	1300	1.32	0.171	0.171	5.83	5.83	34.0	34.0	35.0	28.0	25.6	21.3	0.11
921227	1600	1.46	0.162	0.162	6.19	6.19	16.0	20.0	27.6	26.9	25.0	17.6	0.10
921227	1900	1.33	0.162	0.171	6.19	5.83	22.0	22.0	30.6	34.0	31.0	20.3	0.13
921227	2200	1.24	0.162	0.162	6.19	6.19	32.0	28.0	24.4	44.5	40.4	35.1	0.13
921228	0100	0.45	0.132	0.132	7.56	7.56	-12.0	-18.0	-17.5	17.8	18.5	15.3	0.10
921228	0400	0.57	0.132	0.132	7.56	7.56	-20.0	-20.0	-19.3	17.2	18.1	17.5	0.09
921228	0700	0.61	0.132	0.132	7.56	7.56	-26.0	-34.0	-29.4	33.5	34.2	35.7	0.10
921228	1000	0.93	0.132	0.132	7.56	7.56	-34.0	-6.0	-17.9	29.6	29.9	32.3	0.11
921228	1300	1.31	0.123	0.123	8.16	8.16	-24.0	-24.0	-28.6	26.8	26.3	23.5	0.10
921228	1600	1.37	0.113	0.113	8.87	8.87	-26.0	-26.0	-29.6	19.0	19.8	14.9	0.10
921228	1900	1.39	0.113	0.113	8.87	8.87	-32.0	-26.0	-29.6	18.9	18.1	12.2	0.10
921228	2200	1.40	0.113	0.113	8.87	8.87	-28.0	-28.0	-26.4	19.9	18.5	15.7	0.10
921229	0100	1.64	0.113	0.113	8.87	8.87	-30.0	-28.0	-27.2	15.4	16.1	13.5	0.10
921229	0400	1.76	0.113	0.113	8.87	8.87	-32.0	-32.0	-27.4	19.8	19.1	19.1	0.10
921229	0700	2.06	0.103	0.103	9.71	9.71	-26.0	-24.0	-24.0	16.9	17.4	14.1	0.14
921229	1000	2.10	0.093	0.093	10.72	10.72	-22.0	-22.0	-22.4	18.7	19.9	16.4	0.14
921229	1300	2.00	0.093	0.093	10.72	10.72	-22.0	-20.0	-20.7	19.0	19.5	16.9	0.13
921229	1600	1.88	0.093	0.093	10.72	10.72	-20.0	-20.0	-21.3	19.4	19.8	18.4	0.13
921229	1900	1.61	0.103	0.103	9.71	9.71	-18.0	-18.0	-20.7	18.8	19.2	14.9	0.11
921230	0400	1.09	0.103	0.103	9.71	9.71	-20.0	-18.0	-18.9	14.8	15.2	13.8	0.09
921230	0700	1.01	0.103	0.103	9.71	9.71	-22.0	-20.0	-20.4	17.7	18.1	15.2	0.10
921230	1000	0.89	0.113	0.103	8.87	9.71	-18.0	-18.0	-22.8	19.4	19.2	16.8	0.12
921231	1900	0.46	0.103	0.103	9.71	9.71	-34.0	-32.0	-30.2	15.6	15.2	14.6	0.19
921231	2200	0.45	0.103	0.103	9.71	9.71	-34.0	-32.0	-30.0	15.0	14.9	12.3	0.18
930101	0100	0.45	0.113	0.103	8.87	9.71	-36.0	-34.0	-31.5	15.9	15.1	14.2	0.20
930101	0400	0.42	0.103	0.103	9.71	9.71	-36.0	-30.0	-31.4	17.1	16.8	14.3	0.24
930101	0700	0.43	0.103	0.103	9.71	9.71	-34.0	-34.0	-33.1	21.3	20.7	20.1	0.22
930101	1000	0.43	0.103	0.103	9.71	9.71	-34.0	-34.0	-33.6	29.5	29.5	30.8	0.19
930101	1300	0.46	0.103	0.103	9.71	9.71	-28.0	-28.0	-29.4	35.3	34.8	32.4	0.15
930101	1600	0.51	0.103	0.103	9.71	9.71	-32.0	-32.0	-14.5	40.4	32.8	37.1	0.13
930101	1900	0.51	0.132	0.103	7.56	9.71	12.0	12.0	-13.7	40.6	31.9	32.5	0.14
930101	2200	0.49	0.103	0.103	9.71	9.71	-34.0	-30.0	-20.9	39.2	34.2	34.7	0.18
930102	0100	0.55	0.132	0.103	7.56	9.71	12.0	12.0	-15.4	38.7	30.7	31.8	0.16
930102	0400	0.68	0.132	0.132	7.56	7.56	12.0	14.0	-1.5	32.2	25.1	18.9	0.13
930102	0700	0.66	0.132	0.132	7.56	7.56	10.0	10.0	-2.6	31.2	23.6	15.7	0.13
930102	1000	0.64	0.123	0.132	8.16	7.56	10.0	8.0	-2.0	28.1	22.9	19.2	0.13
930102	1300	0.57	0.103	0.132	9.71	7.56	-38.0	-14.0	-14.0	37.7	28.3	21.7	0.16
930102	1600	0.55	0.132	0.103	7.56	9.71	20.0	-20.0	-7.2	36.8	26.2	23.3	0.16
930102	1900	0.50	0.103	0.103	9.71	9.71	-30.0	-24.0	-12.3	33.5	25.4	22.2	0.14
930102	2200	0.49	0.103	0.103	9.71	9.71	-30.0	-28.0	-18.8	29.2	26.9	24.4	0.16
930103	0100	0.46	0.103	0.103	9.71	9.71	-34.0	-10.0	-16.4	31.0	27.2	25.5	0.17
930103	0400	0.44	0.103	0.103	9.71	9.71	-34.0	-12.0	-19.6	29.1	26.6	24.5	0.16
930103	0700	0.46	0.113	0.113	8.87	8.87	-8.0	-10.0	-12.0	22.3	22.3	19.5	0.16

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{s,ms}$ Hz	$T_{s,ms}$ sec	$T_{s,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$X$
930103	1000	0.45	0.103	0.103	9.71	9.71	-18.0	-14.0	-19.4	23.7	23.3	20.5	0.17
930103	1300	0.44	0.103	0.103	9.71	9.71	-36.0	-36.0	-23.0	26.0	25.7	23.6	0.18
930103	1600	0.47	0.103	0.103	9.71	9.71	-32.0	-12.0	-20.7	24.4	23.5	25.0	0.17
930103	1900	0.45	0.103	0.103	9.71	9.71	-22.0	-14.0	-20.1	24.7	24.3	21.9	0.16
930103	2200	0.46	0.113	0.113	8.87	8.87	-12.0	-10.0	-15.9	25.1	25.8	24.7	0.16
930104	0100	0.48	0.123	0.113	8.16	8.87	-14.0	-12.0	-16.6	22.3	21.5	23.4	0.19
930104	0400	0.47	0.093	0.113	10.72	8.87	-8.0	-10.0	-17.0	21.8	22.8	26.5	0.19
930104	0700	0.46	0.093	0.113	10.72	8.87	-8.0	-10.0	-11.9	20.9	21.7	28.1	0.19
930104	1000	0.50	0.093	0.103	10.72	9.71	-12.0	-12.0	-20.3	20.9	21.1	19.0	0.14
930104	1300	0.49	0.103	0.103	9.71	9.71	-16.0	-16.0	-16.1	23.9	23.6	18.4	0.16
930104	1600	0.49	0.113	0.103	8.87	9.71	-20.0	-18.0	-25.3	26.2	24.5	22.7	0.16
930104	1900	0.48	0.113	0.113	8.87	8.87	-38.0	-36.0	-33.9	28.0	27.2	25.4	0.16
930104	2200	0.47	0.113	0.123	8.87	8.16	-36.0	-36.0	-33.5	27.0	25.3	24.6	0.13
930105	0100	0.49	0.132	0.132	7.56	7.56	-38.0	-36.0	-33.7	25.8	23.4	20.7	0.15
930105	0400	0.56	0.132	0.132	7.56	7.56	-42.0	-40.0	-36.3	21.4	19.5	15.9	0.16
930105	0700	0.72	0.123	0.123	8.16	8.16	-40.0	-38.0	-37.0	13.7	12.8	11.3	0.12
930105	1000	0.74	0.123	0.113	8.16	8.87	-38.0	-36.0	-35.6	12.0	11.7	9.6	0.10
930105	1300	0.77	0.113	0.113	8.87	8.87	-38.0	-38.0	-36.1	13.8	13.2	13.2	0.11
930105	1600	0.75	0.113	0.113	8.87	8.87	-36.0	-36.0	-35.2	14.6	14.9	15.4	0.12
930105	1900	0.65	0.123	0.113	8.16	8.87	-38.0	-32.0	-35.7	14.6	14.8	13.3	0.12
930105	2200	0.61	0.113	0.103	8.87	9.71	-38.0	-36.0	-36.3	13.6	13.9	10.9	0.11
930106	0100	0.59	0.103	0.113	9.71	8.87	-36.0	-36.0	-34.3	15.5	15.2	13.2	0.12
930106	0400	0.55	0.113	0.113	8.87	8.87	-36.0	-36.0	-36.3	16.2	15.1	11.9	0.12
930106	0700	0.60	0.113	0.113	8.87	8.87	-36.0	-36.0	-36.3	15.8	15.6	11.7	0.13
930106	1000	0.59	0.113	0.113	8.87	8.87	-26.0	-28.0	-30.8	16.2	16.5	13.7	0.10
930106	1300	0.54	0.123	0.123	8.16	8.16	-28.0	-28.0	-29.2	15.3	15.0	10.6	0.12
930106	1600	0.54	0.123	0.123	8.16	8.16	-34.0	-34.0	-30.4	18.1	17.7	14.0	0.14
930106	1900	0.49	0.113	0.113	8.87	8.87	-26.0	-28.0	-29.9	19.5	18.5	17.6	0.16
930106	2200	0.47	0.113	0.113	8.87	8.87	-34.0	-34.0	-32.5	22.5	21.5	19.6	0.13
930107	0100	0.50	0.123	0.123	8.16	8.16	-26.0	-24.0	-30.2	24.5	23.7	20.0	0.16
930107	0400	0.49	0.113	0.123	8.87	8.16	-34.0	-32.0	-31.5	25.8	24.8	24.4	0.17
930107	0700	0.48	0.113	0.123	8.87	8.16	-32.0	-32.0	-32.1	23.3	22.5	17.3	0.16
930107	1000	0.47	0.113	0.132	8.87	7.56	-24.0	-28.0	-27.8	25.3	23.6	19.4	0.14
930107	1300	0.48	0.113	0.113	8.87	8.87	-28.0	-28.0	-27.3	22.8	21.9	20.2	0.13
930107	1600	0.49	0.123	0.123	8.16	8.16	-32.0	-32.0	-24.1	25.9	26.1	24.2	0.17
930107	1900	0.47	0.113	0.113	8.87	8.87	-24.0	-28.0	-26.8	32.2	31.2	28.0	0.20
930107	2200	0.47	0.113	0.113	8.87	8.87	-22.0	-26.0	-22.8	25.3	25.0	19.7	0.16
930108	0100	0.50	0.123	0.123	8.16	8.16	-28.0	-28.0	-20.6	28.5	26.9	22.7	0.14
930108	0400	0.50	0.123	0.123	8.16	8.16	-34.0	-32.0	-27.0	30.5	29.4	27.0	0.20
930108	0700	0.50	0.113	0.113	8.87	8.87	-34.0	-32.0	-31.1	32.4	31.8	32.7	0.19
930108	1000	0.52	0.123	0.113	8.16	8.87	-6.0	-34.0	-20.1	29.9	29.3	29.7	0.18
930108	1300	0.59	0.132	0.132	7.56	7.56	-44.0	-42.0	-35.8	30.1	28.4	34.4	0.12
930108	1600	0.59	0.113	0.113	8.87	8.87	-20.0	-38.0	-30.2	30.0	29.6	27.2	0.15
930108	1900	0.60	0.113	0.113	8.87	8.87	-38.0	-38.0	-36.5	35.1	34.2	26.7	0.16
930108	2200	0.86	0.132	0.132	7.56	7.56	8.0	8.0	-20.7	45.2	29.2	23.1	0.11
930109	0100	1.10	0.132	0.132	7.56	7.56	10.0	10.0	-2.4	37.7	26.3	21.0	0.09
930109	0400	1.36	0.123	0.123	8.16	8.16	2.0	2.0	0.0	28.9	24.2	16.5	0.12
930109	0700	1.61	0.123	0.123	8.16	8.16	2.0	2.0	0.8	21.3	21.5	19.8	0.12
930109	1000	1.83	0.113	0.113	8.87	8.87	0.0	0.0	2.4	19.6	20.0	17.5	0.09
930109	1300	2.14	0.103	0.113	9.71	8.87	0.0	0.0	-0.3	18.5	18.8	17.7	0.07
930109	1600	2.45	0.103	0.103	9.71	9.71	-2.0	0.0	2.1	16.9	17.2	14.2	0.08
930109	1900	2.55	0.103	0.103	9.71	9.71	0.0	0.0	0.5	18.0	18.9	14.9	0.09
930109	2200	2.49	0.093	0.093	10.72	10.72	10.0	10.0	7.0	20.1	21.0	16.2	0.09
930110	0100	2.51	0.093	0.093	10.72	10.72	12.0	12.0	6.2	19.8	20.0	18.5	0.08
930110	0400	2.59	0.083	0.083	11.98	11.98	-2.0	-2.0	-1.9	18.8	19.2	14.9	0.08
930110	0700	2.74	0.093	0.083	10.72	11.98	12.0	-2.0	1.4	20.9	21.0	19.4	0.10
930110	1000	2.62	0.083	0.083	11.98	11.98	0.0	0.0	1.1	19.7	19.8	16.4	0.09
930110	1300	2.33	0.083	0.083	11.98	11.98	-2.0	-2.0	-1.3	19.7	19.9	14.3	0.08

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Table A1 (Continued)

Date	Time EST	H <sub>ms</sub> m	f <sub>amb</sub> Hz	f <sub>amb</sub> Hz	T <sub>amb</sub> sec	T <sub>amb</sub> sec	θ <sub>amb</sub> deg	θ <sub>amb</sub> deg	θ <sub>amb</sub> deg	Δθ <sub>amb</sub> deg	Δθ <sub>amb</sub> deg	Δθ <sub>amb</sub> deg	X
930110	1600	2.26	0.093	0.083	10.72	11.98	4.0	0.0	-1.6	19.8	20.0	19.7	0.08
930110	1900	2.16	0.083	0.083	11.98	11.98	6.0	0.0	4.1	21.7	21.8	19.6	0.10
930110	2200	2.16	0.083	0.083	11.98	11.98	0.0	0.0	-1.3	21.5	19.8	15.3	0.10
930111	0100	2.11	0.074	0.074	13.56	13.56	-12.0	-12.0	-5.4	20.5	19.2	14.5	0.08
930111	0400	2.15	0.074	0.083	13.56	11.98	-18.0	-6.0	-7.4	19.9	18.3	20.1	0.08
930111	0700	1.99	0.083	0.083	11.98	11.98	-14.0	-12.0	-8.1	21.0	19.6	19.9	0.10
930111	1000	1.71	0.093	0.093	10.72	10.72	-2.0	-6.0	-5.5	19.9	19.8	16.5	0.11
930111	1300	1.56	0.093	0.083	10.72	11.98	10.0	8.0	0.0	19.8	19.8	17.4	0.09
930111	1600	1.42	0.113	0.083	8.87	11.98	-2.0	-2.0	3.0	20.2	19.6	23.7	0.09
930111	1900	1.38	0.093	0.093	10.72	10.72	-6.0	6.0	-1.8	23.0	23.2	20.4	0.11
930111	2200	1.32	0.093	0.093	10.72	10.72	-8.0	-8.0	-2.3	23.0	23.2	21.0	0.12
930112	0100	1.20	0.093	0.103	10.72	9.71	-2.0	-4.0	-5.3	23.4	23.0	23.9	0.09
930112	0400	1.12	0.103	0.103	9.71	9.71	-12.0	-10.0	-6.3	21.9	22.6	19.6	0.08
930112	0700	1.07	0.103	0.103	9.71	9.71	-2.0	-4.0	-2.7	21.8	22.0	24.4	0.12
930112	1000	0.99	0.103	0.103	9.71	9.71	4.0	4.0	-0.1	24.6	24.6	26.3	0.12
930112	1300	0.94	0.093	0.093	10.72	10.72	-12.0	0.0	-3.0	24.8	25.7	20.6	0.11
930112	1600	0.95	0.093	0.093	10.72	10.72	-12.0	-8.0	-7.7	24.2	23.8	20.7	0.09
930112	1900	0.95	0.093	0.093	10.72	10.72	-10.0	-6.0	4.0	24.9	24.7	20.9	0.10
930112	2200	0.88	0.093	0.132	10.72	7.56	-4.0	-2.0	-2.0	24.5	24.3	27.1	0.12
930113	0100	0.86	0.093	0.093	10.72	10.72	-4.0	-2.0	-3.4	27.2	26.3	21.5	0.11
930113	0400	0.83	0.132	0.123	7.56	8.16	6.0	6.0	-1.3	26.1	24.0	23.1	0.09
930113	0700	0.84	0.123	0.123	8.16	8.16	0.0	2.0	4.9	30.2	26.9	19.2	0.12
930113	1000	0.82	0.123	0.123	8.16	8.16	4.0	4.0	3.8	26.5	23.8	16.6	0.13
930113	1300	0.77	0.113	0.113	8.87	8.87	0.0	0.0	-1.6	23.8	22.6	22.6	0.13
930115	1900	1.49	0.074	0.074	13.56	13.56	-6.0	-8.0	-4.8	18.6	18.7	17.2	0.10
930115	2200	1.52	0.074	0.074	13.56	13.56	-8.0	-6.0	-6.6	18.1	17.9	16.7	0.12
930116	0100	1.57	0.074	0.074	13.56	13.56	-4.0	-4.0	-3.9	17.0	17.1	14.9	0.13
930116	0400	1.57	0.074	0.074	13.56	13.56	-6.0	-10.0	-8.3	17.7	17.2	16.4	0.11
930116	0700	1.49	0.074	0.074	13.56	13.56	-8.0	-8.0	-6.3	18.6	18.5	16.7	0.10
930116	1000	1.39	0.074	0.074	13.56	13.56	-8.0	-8.0	-6.0	19.1	18.6	15.1	0.10
930116	1300	1.40	0.074	0.074	13.56	13.56	-14.0	-10.0	-9.1	18.5	18.4	17.5	0.09
930116	1600	1.54	0.074	0.132	13.56	7.56	-6.0	-10.0	-10.1	18.8	19.1	22.4	0.09
930116	1900	1.80	0.132	0.132	7.56	7.56	0.0	-14.0	-6.5	20.4	18.6	19.3	0.08
930116	2200	1.74	0.123	0.132	8.16	7.56	4.0	4.0	-7.3	19.8	19.3	20.0	0.09
930117	0100	1.66	0.113	0.113	8.87	8.87	2.0	2.0	-2.0	18.2	17.4	12.1	0.09
930117	0400	1.45	0.103	0.103	9.71	9.71	0.0	0.0	-2.6	17.6	16.5	10.5	0.10
930117	0700	1.32	0.103	0.103	9.71	9.71	2.0	0.0	-1.1	18.1	17.2	13.9	0.09
930117	1000	1.21	0.093	0.093	10.72	10.72	-10.0	-10.0	-6.0	18.7	18.3	17.9	0.09
930117	1300	1.14	0.074	0.093	13.56	10.72	-10.0	-10.0	-3.8	18.6	17.7	18.6	0.11
930117	1600	1.02	0.074	0.093	13.56	10.72	-10.0	-10.0	-3.1	21.1	20.6	20.2	0.13
930117	1900	0.89	0.083	0.083	11.98	11.98	-10.0	-10.0	-6.9	21.2	21.0	16.4	0.10
930117	2200	0.82	0.083	0.083	11.98	11.98	-12.0	-10.0	-7.2	17.5	18.2	11.4	0.10
930118	0100	0.71	0.083	0.093	11.98	10.72	-10.0	-10.0	-4.1	21.0	22.8	20.1	0.19
930118	0400	0.61	0.083	0.093	11.98	10.72	-10.0	-10.0	-7.0	23.7	24.4	23.0	0.19
930118	0700	0.55	0.093	0.093	10.72	10.72	6.0	-12.0	-4.1	24.5	24.2	19.3	0.15
930118	1000	0.63	0.083	0.083	11.98	11.98	8.0	8.0	2.8	22.2	22.1	23.3	0.12
930118	1300	0.74	0.083	0.083	11.98	11.98	4.0	2.0	1.8	17.6	17.6	18.1	0.12
930118	1600	0.73	0.083	0.083	11.98	11.98	6.0	6.0	2.3	18.2	19.1	17.2	0.10
930118	1900	0.62	0.083	0.083	11.98	11.98	-8.0	-10.0	-0.5	22.8	23.5	20.1	0.11
930118	2200	0.61	0.083	0.083	11.98	11.98	-2.0	-12.0	-5.2	22.9	22.2	18.8	0.10
930119	0100	0.59	0.083	0.083	11.98	11.98	-12.0	-10.0	-5.5	21.8	20.4	13.5	0.11
930119	0400	0.52	0.083	0.093	11.98	10.72	-12.0	-12.0	-9.2	23.3	23.0	20.7	0.13
930119	0700	0.46	0.093	0.093	10.72	10.72	-14.0	-14.0	-11.7	23.3	24.0	22.9	0.12
930119	1000	0.46	0.093	0.093	10.72	10.72	-12.0	-14.0	-13.7	21.0	21.5	18.0	0.14
930119	1300	0.43	0.103	0.093	9.71	10.72	-12.0	-14.0	-13.5	20.1	20.0	21.1	0.15
930119	1600	0.41	0.103	0.103	9.71	9.71	-10.0	-10.0	-8.4	21.8	21.8	20.0	0.16
930119	1900	0.40	0.123	0.132	8.16	7.56	-14.0	-14.0	-6.4	21.9	21.6	25.2	0.13

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Table A1 (Continued)

Date	Time EST	H <sub>m</sub> m	f <sub>h,0</sub> Hz	f <sub>h,10</sub> Hz	T <sub>h,0</sub> sec	T <sub>h,10</sub> sec	θ <sub>h,0</sub> deg	θ <sub>h,10</sub> deg	θ <sub>h,20</sub> deg	Δθ <sub>h,0</sub> deg	Δθ <sub>h,10</sub> deg	Δθ <sub>h,20</sub> deg	x
930119	2200	0.39	0.123	0.132	8.16	7.56	-16.0	-14.0	-10.9	19.9	20.1	17.2	0.12
930120	0100	0.41	0.132	0.132	7.56	7.56	-12.0	-14.0	-12.7	17.3	17.7	14.4	0.12
930120	0400	0.43	0.123	0.123	8.16	8.16	-14.0	-14.0	-13.8	14.1	15.5	11.5	0.14
930120	0700	0.49	0.113	0.113	8.87	8.87	-14.0	-14.0	-14.1	10.7	12.3	7.9	0.12
930120	1300	0.47	0.113	0.123	8.87	8.16	-16.0	-16.0	-14.6	12.4	12.9	11.9	0.10
930120	1600	0.39	0.113	0.113	8.87	8.87	-14.0	-14.0	-15.0	18.7	18.9	14.8	0.11
930120	1900	0.39	0.113	0.113	8.87	8.87	-18.0	-18.0	-17.5	22.0	21.8	18.6	0.11
930120	2200	0.40	0.113	0.113	8.87	8.87	-14.0	-14.0	-15.6	19.1	19.2	18.1	0.10
930121	0100	0.37	0.123	0.123	8.16	8.16	-18.0	-16.0	-12.3	20.8	20.7	20.8	0.12
930121	0400	0.36	0.103	0.123	9.71	8.16	-16.0	-16.0	-12.4	21.2	21.2	19.7	0.12
930121	0700	0.32	0.103	0.103	9.71	9.71	-10.0	-12.0	-17.1	21.0	21.2	21.6	0.12
930121	1000	0.32	0.113	0.113	8.87	8.87	-18.0	-12.0	-12.3	20.2	20.5	19.7	0.11
930121	1300	0.29	0.103	0.113	9.71	8.87	-16.0	-16.0	-15.5	21.2	21.0	20.9	0.13
930121	1600	0.28	0.132	0.123	7.56	8.16	-16.0	-16.0	-14.6	20.9	20.8	24.4	0.12
930121	1900	0.29	0.132	0.132	7.56	7.56	-16.0	-18.0	-14.8	22.8	22.9	23.4	0.15
930121	2200	0.26	0.123	0.123	8.16	8.16	-16.0	-16.0	-14.9	21.5	21.3	16.3	0.14
930122	0100	0.28	0.132	0.132	7.56	7.56	-40.0	-16.0	-21.5	27.6	26.9	25.1	0.15
930122	0400	0.55	0.132	0.132	7.56	7.56	-42.0	-40.0	-38.4	12.5	11.9	8.1	0.11
930122	0700	0.66	0.123	0.132	8.16	7.56	-42.0	-42.0	-40.2	13.4	12.0	10.0	0.11
930122	1000	0.53	0.123	0.123	8.16	8.16	-40.0	-42.0	-38.7	15.1	13.8	10.4	0.11
930122	1300	0.55	0.113	0.113	8.87	8.87	-38.0	-38.0	-37.8	12.5	11.3	7.1	0.10
930122	1600	0.58	0.123	0.123	8.16	8.16	-40.0	-40.0	-38.4	14.9	12.8	8.2	0.11
930122	1900	0.54	0.113	0.113	8.87	8.87	-40.0	-40.0	-38.8	17.5	14.8	10.5	0.12
930122	2200	0.51	0.113	0.113	8.87	8.87	-38.0	-38.0	-37.9	18.3	19.0	12.8	0.12
930123	0100	0.44	0.103	0.103	9.71	9.71	-36.0	-38.0	-35.9	24.7	22.6	14.1	0.11
930123	0400	0.41	0.113	0.113	8.87	8.87	-36.0	-36.0	-34.9	27.7	22.8	16.9	0.12
930123	0700	0.36	0.113	0.113	8.87	8.87	-36.0	-38.0	-34.3	34.5	32.2	33.7	0.12
930123	1000	0.35	0.113	0.113	8.87	8.87	-34.0	-34.0	-30.2	35.0	33.8	32.5	0.15
930123	1300	0.35	0.113	0.113	8.87	8.87	-36.0	-36.0	-28.0	32.3	30.6	35.3	0.12
930123	1600	0.36	0.123	0.113	8.16	8.87	-34.0	-34.0	-24.4	28.8	25.4	20.0	0.15
930123	1900	0.34	0.113	0.103	8.87	9.71	-32.0	-32.0	-21.4	30.7	29.3	23.9	0.13
930123	2200	0.34	0.113	0.103	8.87	9.71	-32.0	-8.0	-23.0	28.4	25.0	26.2	0.16
930124	0100	0.35	0.083	0.113	11.98	8.87	-4.0	-16.0	-21.7	25.5	23.4	24.8	0.13
930124	0400	0.36	0.074	0.083	13.56	11.98	-14.0	-14.0	-22.4	25.4	22.8	23.5	0.15
930124	0700	0.35	0.083	0.083	11.98	11.98	-8.0	-18.0	-23.6	24.8	23.7	19.8	0.15
930124	1000	0.36	0.083	0.083	11.98	11.98	-22.0	-16.0	-24.4	23.2	21.8	21.2	0.18
930124	1300	0.35	0.083	0.083	11.98	11.98	-14.0	-16.0	-17.8	23.3	21.2	17.9	0.15
930124	1600	0.34	0.083	0.083	11.98	11.98	-18.0	-18.0	-23.9	25.0	21.8	17.9	0.16
930124	1900	0.39	0.132	0.132	7.56	7.56	-40.0	-38.0	-27.4	27.5	17.4	7.6	0.14
930124	2200	0.41	0.132	0.132	7.56	7.56	-40.0	-40.0	-30.5	25.6	16.4	7.7	0.16
930125	0100	0.40	0.132	0.132	7.56	7.56	-40.0	-40.0	-27.1	27.2	17.6	10.9	0.14
930125	0400	0.34	0.132	0.132	7.56	7.56	-42.0	-10.0	-24.9	30.3	21.0	13.9	0.16
930125	0700	0.37	0.132	0.132	7.56	7.56	14.0	-8.0	-5.2	35.9	34.0	51.7	0.19
930125	1000	0.52	0.123	0.132	8.16	7.56	14.0	12.0	7.9	25.0	18.4	16.5	0.11
930125	1300	0.47	0.132	0.132	7.56	7.56	14.0	14.0	4.0	26.5	21.8	15.6	0.10
930125	1600	0.36	0.083	0.132	11.98	7.56	-14.0	-16.0	-14.0	27.8	27.2	36.3	0.15
930125	2200	0.36	0.074	0.074	13.56	13.56	-18.0	-16.0	-16.6	25.9	26.1	16.5	0.13
930126	0100	0.36	0.123	0.132	8.16	7.56	-16.0	-16.0	-15.6	25.7	26.3	30.6	0.13
930126	0400	0.39	0.132	0.132	7.56	7.56	-8.0	-16.0	-13.2	27.2	27.0	30.4	0.13
930126	0700	0.41	0.132	0.132	7.56	7.56	-8.0	-10.0	-12.7	27.3	25.8	26.2	0.15
930126	1000	0.45	0.132	0.132	7.56	7.56	24.0	-14.0	1.5	31.3	27.7	31.2	0.12
930126	1300	0.50	0.132	0.132	7.56	7.56	24.0	-12.0	2.5	33.0	27.0	31.3	0.10
930126	1600	0.56	0.132	0.132	7.56	7.56	-12.0	-12.0	-12.9	22.4	21.3	26.3	0.09
930126	1900	1.11	0.132	0.132	7.56	7.56	-16.0	-14.0	-14.1	14.0	15.9	20.3	0.08
930126	2200	1.59	0.113	0.132	8.87	7.56	-6.0	-6.0	-6.5	17.1	16.7	20.2	0.08
930127	0100	1.88	0.103	0.103	9.71	9.71	-18.0	-18.0	-11.2	20.7	19.0	15.6	0.07
930127	0400	1.83	0.103	0.103	9.71	9.71	-12.0	-12.0	-10.7	18.4	17.0	13.4	0.08

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{A,ms}$ Hz	$f_{S,ms}$ Hz	$T_{A,ms}$ sec	$T_{S,ms}$ sec	$\theta_{A,ms}$ deg	$\theta_{S,ms}$ deg	$\theta_{A,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\lambda$
930127	0700	1.95	0.103	0.103	9.71	9.71	-18.0	-16.0	-9.1	22.1	19.1	17.6	0.08
930127	1000	2.22	0.093	0.093	10.72	10.72	-12.0	-16.0	-6.0	20.1	15.1	11.1	0.08
930127	1300	1.94	0.093	0.093	10.72	10.72	-12.0	-12.0	-6.1	18.8	17.6	12.3	0.08
930127	1600	1.76	0.093	0.093	10.72	10.72	-16.0	-12.0	-4.7	21.4	17.8	20.9	0.07
930127	1900	1.61	0.083	0.093	11.98	10.72	-10.0	-2.0	-3.7	20.2	17.5	22.0	0.08
930127	2200	1.36	0.083	0.083	11.98	11.98	-14.0	-14.0	-6.1	21.8	16.8	12.6	0.11
930128	0100	1.29	0.083	0.083	11.98	11.98	-10.0	-10.0	-7.0	19.2	15.8	10.7	0.10
930128	0400	1.20	0.083	0.093	11.98	10.72	-12.0	-12.0	-6.2	19.9	15.1	17.1	0.08
930128	0700	1.10	0.083	0.093	11.98	10.72	-16.0	-14.0	-4.8	23.1	17.2	20.2	0.11
930128	1000	1.09	0.093	0.093	10.72	10.72	-12.0	-12.0	-5.1	26.5	20.3	20.5	0.12
930128	1300	1.05	0.093	0.093	10.72	10.72	-30.0	-12.0	-11.0	27.9	20.3	20.4	0.11
930128	1600	1.00	0.093	0.093	10.72	10.72	-30.0	0.0	-10.1	26.9	22.8	27.6	0.08
930128	1900	0.89	0.093	0.093	10.72	10.72	-32.0	-12.0	-16.1	30.0	22.8	24.0	0.10
930128	2200	0.81	0.093	0.093	10.72	10.72	-30.0	-30.0	-17.2	27.2	23.9	20.8	0.17
930129	0100	0.69	0.093	0.093	10.72	10.72	-32.0	-32.0	-23.8	28.2	23.9	17.4	0.15
930129	0400	0.60	0.093	0.093	10.72	10.72	-34.0	-34.0	-23.5	27.3	24.7	22.5	0.11
930129	0700	0.55	0.093	0.093	10.72	10.72	-30.0	-30.0	-25.6	23.0	21.7	15.5	0.13
930129	1000	0.52	0.093	0.093	10.72	10.72	-30.0	-28.0	-27.8	19.5	17.8	14.6	0.17
930129	1300	0.53	0.093	0.083	10.72	11.98	-32.0	-32.0	-29.1	21.6	19.4	21.5	0.18
930129	1600	0.54	0.093	0.083	10.72	11.98	-30.0	-30.0	-29.4	17.5	15.5	18.0	0.12
930129	1900	0.49	0.093	0.093	10.72	10.72	-34.0	-34.0	-30.2	25.7	22.5	16.7	0.14
930129	2200	0.54	0.093	0.093	10.72	10.72	-32.0	-32.0	-13.9	44.1	19.9	16.1	0.12
930130	0100	0.74	0.132	0.132	7.56	7.56	26.0	12.0	3.9	32.6	19.7	14.5	0.09
930130	0400	0.83	0.132	0.132	7.56	7.56	24.0	12.0	9.9	24.7	18.9	13.9	0.08
930130	0700	0.53	0.093	0.093	10.72	10.72	-32.0	12.0	-7.8	35.8	21.2	20.0	0.10
930130	1000	0.43	0.103	0.103	9.71	9.71	-34.0	-32.0	-16.8	35.7	21.6	15.0	0.13
930130	1300	0.37	0.103	0.103	9.71	9.71	-32.0	-32.0	-20.3	30.8	22.3	15.6	0.14
930130	1600	0.35	0.103	0.103	9.71	9.71	-32.0	-32.0	-21.4	25.7	20.8	13.9	0.12
930130	1900	0.32	0.103	0.103	9.71	9.71	-30.0	-30.0	-26.0	19.9	18.2	11.3	0.13
930130	2200	0.26	0.103	0.103	9.71	9.71	-32.0	-32.0	-28.1	18.4	15.2	14.0	0.15
930131	0100	0.21	0.103	0.103	9.71	9.71	-32.0	-32.0	-28.6	16.5	14.7	11.0	0.17
930131	0400	0.17	0.103	0.103	9.71	9.71	-28.0	-30.0	-25.4	18.4	15.9	12.1	0.22
930131	0700	0.15	0.103	0.103	9.71	9.71	-32.0	-32.0	-22.7	23.5	16.2	15.1	0.27
930131	1000	0.14	0.103	0.103	9.71	9.71	-30.0	-32.0	-24.9	22.1	15.3	12.8	0.23
930131	1300	0.13	0.113	0.113	8.87	8.87	-34.0	-34.0	-27.4	20.7	14.3	9.1	0.20
930131	1600	0.14	0.132	0.113	7.56	8.87	-38.0	-38.0	-29.5	20.2	12.6	9.3	0.21
930131	1900	0.24	0.132	0.132	7.56	7.56	-38.0	-38.0	-34.2	5.1	5.9	2.4	0.17
930131	2200	0.24	0.132	0.132	7.56	7.56	-38.0	-38.0	-35.6	4.6	6.8	3.2	0.16
930201	0100	0.26	0.123	0.132	8.16	7.56	-40.0	-40.0	-38.1	4.6	6.9	3.5	0.17
930201	0400	0.25	0.132	0.132	7.56	7.56	-40.0	-40.0	-37.1	8.9	10.0	3.4	0.17
930201	0700	0.23	0.132	0.132	7.56	7.56	-40.0	-40.0	-35.0	19.1	12.6	3.9	0.18
930201	1000	0.19	0.123	0.123	8.16	8.16	-42.0	-40.0	-33.8	32.1	22.3	7.1	0.17
930201	1300	0.23	0.142	0.142	7.04	7.04	22.0	22.0	-5.2	55.3	33.5	8.1	0.23
930201	1600	1.10	0.142	0.142	7.04	7.04	24.0	24.0	23.0	15.5	14.3	14.9	0.09
930201	1900	1.37	0.142	0.142	7.04	7.04	32.0	28.0	27.0	16.1	13.9	13.0	0.08
930201	2200	1.64	0.132	0.132	7.56	7.56	24.0	24.0	22.2	16.7	13.7	12.3	0.09
930202	0100	1.60	0.123	0.123	8.16	8.16	22.0	22.0	18.7	17.7	14.5	12.6	0.10
930202	0400	1.52	0.132	0.132	7.56	7.56	22.0	22.0	19.2	17.7	14.5	12.4	0.10
930202	0700	1.64	0.123	0.123	8.16	8.16	22.0	22.0	19.9	19.1	13.6	11.7	0.09
930202	1000	1.52	0.142	0.142	7.04	7.04	32.0	20.0	19.2	20.1	15.3	13.3	0.10
930202	1300	1.36	0.142	0.142	7.04	7.04	30.0	10.0	14.6	19.2	13.7	13.5	0.10
930202	1600	1.28	0.132	0.142	7.56	7.04	22.0	12.0	15.6	19.4	15.6	16.6	0.11
930202	1900	1.43	0.093	0.093	10.72	10.72	8.0	8.0	11.0	15.1	13.9	10.7	0.10
930202	2200	1.67	0.093	0.093	10.72	10.72	0.0	2.0	4.8	15.6	15.1	13.6	0.11
930203	0100	1.84	0.083	0.083	11.98	11.98	8.0	2.0	2.8	16.1	15.8	13.8	0.11
930203	0400	2.17	0.074	0.074	13.56	13.56	-4.0	-4.0	-1.0	18.0	17.1	15.2	0.10
930203	0700	2.39	0.064	0.064	15.63	15.63	-10.0	-10.0	-3.9	19.9	17.6	12.9	0.09
930203	1000	2.38	0.064	0.074	15.63	13.56	-12.0	-10.0	-6.5	17.7	15.9	16.0	0.08

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{A,0}$ Hz	$f_{A,10}$ Hz	$T_{A,0}$ sec	$T_{A,10}$ sec	$\theta_{A,0}$ deg	$\theta_{A,10}$ deg	$\theta_{A,20}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{10}$ deg	$\Delta\theta_{20}$ deg	$X$
930203	1300	2.28	0.064	0.074	15.63	13.56	-8.0	-8.0	-6.2	16.5	16.1	15.4	0.09
930203	1600	2.11	0.074	0.074	13.56	13.56	-6.0	-6.0	-4.8	19.0	17.5	19.6	0.10
930203	1900	2.05	0.064	0.064	15.63	15.63	-14.0	-12.0	-11.5	16.1	15.4	13.6	0.10
930203	2200	1.91	0.074	0.074	13.56	13.56	-10.0	-12.0	-10.0	13.6	13.3	12.0	0.09
930204	0100	1.75	0.064	0.074	15.63	13.56	-10.0	-10.0	-8.5	15.0	14.4	15.9	0.12
930204	0400	1.54	0.064	0.074	15.63	13.56	-12.0	-10.0	-8.8	14.8	14.8	15.8	0.16
930204	0700	1.38	0.074	0.074	13.56	13.56	-8.0	-8.0	-6.8	16.1	15.6	14.1	0.14
930204	1000	1.24	0.074	0.074	13.56	13.56	8.0	-10.0	-0.5	18.3	18.0	18.5	0.11
930204	1300	1.12	0.074	0.074	13.56	13.56	-10.0	-10.0	-7.1	16.1	15.9	15.3	0.11
930204	1600	1.08	0.074	0.074	13.56	13.56	-8.0	-6.0	-2.4	19.0	15.1	14.8	0.13
930204	1900	0.96	0.074	0.074	13.56	13.56	-6.0	-8.0	-3.8	16.9	15.7	13.8	0.13
930204	2200	0.85	0.074	0.074	13.56	13.56	-10.0	-8.0	-4.4	19.7	17.9	15.7	0.11
930205	0100	0.88	0.083	0.083	11.98	11.98	-10.0	12.0	-0.7	22.6	19.3	20.4	0.12
930205	0400	0.84	0.083	0.083	11.98	11.98	-4.0	6.0	4.6	22.3	17.7	16.7	0.15
930205	0700	0.79	0.083	0.083	11.98	11.98	-10.0	-10.0	1.6	25.9	18.2	20.0	0.17
930205	1000	0.77	0.083	0.083	11.98	11.98	-12.0	-12.0	0.4	23.1	16.4	12.7	0.11
930205	1300	0.63	0.083	0.083	11.98	11.98	-8.0	-6.0	1.0	21.5	17.8	13.8	0.12
930205	1600	0.58	0.093	0.093	10.72	10.72	0.0	-2.0	1.5	22.0	21.3	20.3	0.16
930205	1900	0.50	0.083	0.083	11.98	11.98	-8.0	-6.0	-3.9	21.5	21.8	14.7	0.19
930205	2200	0.42	0.093	0.093	10.72	10.72	-4.0	-4.0	-5.5	19.8	19.3	15.7	0.16
930206	0100	0.41	0.093	0.093	10.72	10.72	-16.0	-14.0	-12.0	20.1	20.5	17.6	0.17
930206	0400	0.37	0.103	0.093	9.71	10.72	-10.0	-12.0	-12.6	17.3	17.6	13.9	0.15
930206	0700	0.31	0.093	0.093	10.72	10.72	-14.0	-14.0	-16.9	17.0	16.7	13.8	0.16
930206	1000	0.27	0.093	0.093	10.72	10.72	-12.0	-14.0	-14.8	17.9	17.0	15.2	0.24
930206	1300	0.27	0.093	0.093	10.72	10.72	-22.0	-20.0	-20.1	19.6	18.9	16.9	0.26
930206	1600	0.27	0.093	0.093	10.72	10.72	-20.0	-20.0	-20.7	19.9	22.4	12.0	0.19
930206	1900	0.89	0.142	0.142	7.04	7.04	36.0	36.0	30.5	16.2	16.4	13.2	0.11
930206	2200	1.02	0.142	0.142	7.04	7.04	28.0	24.0	19.6	16.2	15.5	13.1	0.09
930207	0100	0.97	0.113	0.113	8.87	8.87	14.0	10.0	12.2	16.7	16.6	14.5	0.10
930207	0400	1.09	0.113	0.113	8.87	8.87	12.0	12.0	14.8	18.3	17.0	13.5	0.12
930207	0700	1.08	0.103	0.103	9.71	9.71	4.0	8.0	8.1	17.2	16.5	13.8	0.11
930207	1000	0.97	0.103	0.103	9.71	9.71	12.0	12.0	10.1	16.7	16.6	15.9	0.11
930207	1300	0.91	0.113	0.113	8.87	8.87	6.0	10.0	7.9	17.3	17.2	13.4	0.10
930207	1600	0.83	0.113	0.113	8.87	8.87	4.0	12.0	8.7	16.7	17.1	15.2	0.12
930207	1900	0.86	0.113	0.113	8.87	8.87	2.0	6.0	4.1	19.1	19.0	15.6	0.12
930207	2200	0.80	0.093	0.113	10.72	8.87	-16.0	-16.0	2.7	27.4	22.2	25.8	0.12
930208	0100	0.76	0.103	0.103	9.71	9.71	-18.0	-18.0	-7.6	23.7	21.8	16.4	0.10
930208	0400	0.72	0.113	0.113	8.87	8.87	-14.0	-14.0	-7.6	23.6	21.1	18.7	0.12
930208	0700	0.70	0.103	0.123	9.71	8.16	-10.0	-12.0	-1.3	26.6	27.5	26.2	0.15
930208	1000	0.85	0.142	0.142	7.04	7.04	-42.0	-42.0	-26.3	35.9	23.1	18.0	0.11
930208	1300	1.03	0.123	0.132	8.16	7.56	-32.0	-32.0	-22.0	33.7	31.8	33.2	0.09
930208	1600	1.37	0.132	0.132	7.56	7.56	16.0	16.0	8.0	30.9	29.1	31.9	0.08
930208	1900	1.64	0.142	0.142	7.04	7.04	22.0	12.0	9.3	30.6	24.5	15.6	0.08
930208	2200	1.62	0.132	0.132	7.56	7.56	12.0	12.0	6.9	24.9	20.3	20.7	0.08
930209	0100	1.44	0.123	0.123	8.16	8.16	12.0	12.0	4.2	21.0	16.4	18.7	0.08
930209	0400	1.47	0.113	0.123	8.87	8.16	0.0	0.0	-1.6	18.5	15.1	14.2	0.09
930209	0700	1.56	0.113	0.103	8.87	9.71	0.0	-2.0	-0.6	20.2	16.5	15.8	0.10
930209	1000	1.46	0.083	0.103	11.98	9.71	-12.0	0.0	-0.9	20.4	16.0	15.5	0.09
930209	1300	1.44	0.103	0.113	9.71	8.87	0.0	-2.0	-1.9	19.4	16.5	15.8	0.12
930209	1600	1.43	0.113	0.113	8.87	8.87	0.0	0.0	-3.1	19.9	18.1	13.2	0.08
930209	1900	1.34	0.093	0.093	10.72	10.72	-14.0	-12.0	-5.9	20.5	18.0	11.7	0.10
930209	2200	1.31	0.083	0.113	11.98	8.87	-12.0	-14.0	-4.2	21.4	18.3	12.7	0.10
930210	0100	1.19	0.093	0.093	10.72	10.72	-12.0	-2.0	-3.7	20.4	18.1	13.0	0.09
930210	0400	1.11	0.093	0.093	10.72	10.72	-14.0	-14.0	-4.9	19.7	17.8	12.4	0.08
930210	0700	0.96	0.093	0.093	10.72	10.72	-8.0	-6.0	-0.5	22.6	19.7	13.7	0.11
930210	1000	0.90	0.103	0.103	9.71	9.71	-24.0	-24.0	-14.3	27.2	25.4	19.2	0.12
930210	1300	0.76	0.103	0.103	9.71	9.71	-18.0	-12.0	-4.8	24.8	23.9	23.7	0.10
930210	1600	0.74	0.113	0.103	8.87	9.71	-22.0	-22.0	-9.8	23.6	22.9	20.1	0.09

(Sheet 22 of 47)

Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{a,ms}$ Hz	$T_{s,ms}$ sec	$T_{a,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{a,ms}$ deg	$\theta_{a,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\chi$
930210	1900	0.72	0.103	0.103	9.71	9.71	-18.0	-18.0	-11.8	22.5	22.7	17.3	0.13
930210	2200	0.65	0.103	0.103	9.71	9.71	-20.0	-16.0	-10.2	25.8	25.3	23.5	0.14
930211	0100	0.65	0.103	0.103	9.71	9.71	-16.0	-16.0	-13.1	24.2	23.7	19.4	0.14
930211	0400	0.59	0.103	0.113	9.71	8.87	-20.0	-20.0	-16.6	23.6	22.9	19.4	0.11
930211	0700	0.58	0.113	0.113	8.87	8.87	-18.0	-22.0	-19.7	23.1	23.4	20.2	0.12
930211	1000	0.55	0.113	0.113	8.87	8.87	-18.0	-18.0	-17.9	23.8	24.1	21.6	0.13
930211	1300	0.50	0.123	0.113	8.16	8.87	-14.0	-16.0	-12.8	23.3	23.5	22.6	0.16
930211	1600	0.51	0.132	0.123	7.56	8.16	-8.0	-8.0	-12.5	24.9	24.9	25.1	0.13
930211	1900	0.57	0.132	0.142	7.56	7.04	-14.0	-14.0	-16.5	22.9	22.7	20.0	0.14
930211	2200	1.05	0.132	0.142	7.56	7.04	-2.0	-2.0	-1.5	21.7	20.5	19.8	0.10
930212	0100	1.80	0.123	0.123	8.16	8.16	-8.0	8.0	5.2	21.5	21.0	21.2	0.08
930212	0400	2.29	0.103	0.103	9.71	9.71	0.0	-2.0	2.7	18.7	18.8	17.5	0.08
930212	0700	2.38	0.093	0.093	10.72	10.72	0.0	4.0	2.8	16.6	17.5	14.4	0.08
930212	1000	2.31	0.093	0.093	10.72	10.72	2.0	2.0	1.0	16.5	16.7	13.1	0.10
930212	1300	2.07	0.083	0.083	11.98	11.98	2.0	4.0	5.6	16.3	16.3	13.6	0.09
930212	1600	1.80	0.093	0.093	10.72	10.72	4.0	2.0	2.3	17.5	17.6	12.7	0.09
930212	1900	1.72	0.093	0.093	10.72	10.72	-4.0	-4.0	1.8	20.3	19.5	17.5	0.09
930212	2200	1.65	0.093	0.093	10.72	10.72	4.0	4.0	1.0	20.4	20.1	17.1	0.11
930213	0100	1.32	0.093	0.093	10.72	10.72	0.0	-6.0	2.4	21.7	21.9	18.0	0.12
930213	0400	1.15	0.093	0.093	10.72	10.72	2.0	0.0	3.1	23.3	24.2	19.2	0.12
930213	0700	1.00	0.093	0.093	10.72	10.72	0.0	4.0	3.7	23.2	23.3	21.5	0.11
930213	1000	0.83	0.093	0.093	10.72	10.72	-10.0	-8.0	-8.2	24.1	25.7	21.1	0.14
930213	1300	0.80	0.093	0.093	10.72	10.72	-6.0	-4.0	-3.9	19.3	21.1	14.9	0.14
930213	1600	0.80	0.093	0.093	10.72	10.72	-8.0	-4.0	-2.7	20.6	21.5	18.0	0.15
930213	1900	0.86	0.083	0.083	11.98	11.98	-2.0	0.0	-2.6	19.1	19.6	16.0	0.11
930213	2200	0.84	0.083	0.083	11.98	11.98	4.0	2.0	-1.6	20.6	20.5	17.9	0.15
930214	0100	0.69	0.083	0.083	11.98	11.98	-2.0	0.0	-4.2	22.5	23.1	20.0	0.19
930214	0400	0.56	0.083	0.083	11.98	11.98	-2.0	-2.0	-4.8	20.3	21.2	16.7	0.20
930214	0700	0.48	0.093	0.083	10.72	11.98	-10.0	2.0	-3.9	21.5	23.0	19.7	0.18
930214	1000	0.48	0.083	0.083	11.98	11.98	-12.0	2.0	-3.1	24.2	24.8	23.6	0.17
930214	1300	0.53	0.083	0.083	11.98	11.98	10.0	6.0	6.0	25.2	21.0	22.8	0.14
930214	1600	0.51	0.083	0.083	11.98	11.98	4.0	6.0	2.2	25.2	22.6	19.1	0.15
930214	1900	0.50	0.083	0.083	11.98	11.98	2.0	2.0	3.5	23.5	20.3	18.5	0.15
930214	2200	0.48	0.083	0.083	11.98	11.98	-2.0	0.0	0.9	24.1	22.3	21.1	0.16
930215	0100	0.46	0.083	0.083	11.98	11.98	12.0	12.0	6.0	22.6	22.3	19.1	0.12
930215	0400	0.49	0.142	0.083	7.04	11.98	18.0	14.0	-0.1	24.6	20.9	21.1	0.13
930215	0700	0.53	0.142	0.142	7.04	7.04	14.0	14.0	4.1	26.8	21.0	12.4	0.13
930215	1000	0.48	0.083	0.142	11.98	7.04	-2.0	10.0	5.7	27.7	23.5	21.2	0.16
930215	1300	0.46	0.142	0.083	7.04	11.98	18.0	16.0	-1.6	28.4	22.2	20.1	0.17
930215	1600	0.44	0.083	0.083	11.98	11.98	-6.0	-6.0	-1.1	25.8	21.3	18.3	0.13
930215	1900	0.42	0.083	0.083	11.98	11.98	-8.0	-8.0	-4.7	23.2	22.8	16.0	0.12
930215	2200	0.41	0.093	0.093	10.72	10.72	-4.0	-6.0	-5.6	26.7	25.8	22.0	0.12
930216	0100	0.38	0.093	0.093	10.72	10.72	-6.0	-4.0	-8.4	28.1	28.0	23.3	0.16
930216	0400	0.36	0.083	0.083	11.98	11.98	-4.0	6.0	-5.2	29.4	29.2	21.9	0.17
930216	0700	0.36	0.093	0.083	10.72	11.98	8.0	4.0	-3.9	26.3	26.1	21.3	0.15
930216	1000	0.49	0.132	0.142	7.56	7.04	-40.0	-40.0	-27.4	36.3	19.0	17.2	0.11
930216	1300	0.92	0.132	0.132	7.56	7.56	-40.0	-36.0	-34.6	16.7	14.1	11.0	0.09
930216	1600	0.86	0.132	0.123	7.56	8.16	-40.0	-38.0	-34.3	20.5	14.9	12.7	0.10
930216	1900	0.86	0.123	0.123	8.16	8.16	-40.0	-38.0	-31.8	18.5	14.6	10.5	0.10
930216	2200	0.81	0.113	0.113	8.87	8.87	-38.0	-38.0	-34.1	20.4	15.1	12.2	0.10
930217	0100	0.72	0.123	0.113	8.16	8.87	-38.0	-38.0	-31.3	22.7	15.6	9.9	0.13
930217	0400	0.57	0.113	0.093	8.87	10.72	-38.0	-38.0	-29.5	33.4	21.8	35.8	0.14
930217	0700	0.47	0.103	0.093	9.71	10.72	-34.0	-36.0	-27.0	33.7	27.0	32.6	0.14
930217	1000	0.44	0.103	0.103	9.71	9.71	-32.0	-34.0	-19.4	32.4	29.9	37.1	0.14
930217	1600	0.46	0.113	0.113	8.87	8.87	-36.0	-36.0	-17.6	35.7	30.2	22.7	0.13
930217	1900	0.46	0.113	0.113	8.87	8.87	-36.0	-24.0	-15.4	34.6	31.7	33.2	0.14
930217	2200	0.43	0.113	0.123	8.87	8.16	-20.0	-20.0	-24.8	33.3	29.7	29.1	0.12

(Sheet 23 of 47)

Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{s,0}$ Hz	$f_{s,1}$ Hz	$T_{s,0}$ sec	$T_{s,1}$ sec	$\theta_{s,0}$ deg	$\theta_{s,1}$ deg	$\theta_{s,2}$ deg	$\Delta\theta_{s,0}$ deg	$\Delta\theta_{s,1}$ deg	$\Delta\theta_{s,2}$ deg	$\chi$
930218	0100	0.41	0.113	0.113	8.87	8.87	-32.0	-20.0	-24.9	30.9	26.2	23.9	0.12
930218	0400	0.38	0.132	0.113	7.56	8.87	-40.0	-22.0	-22.6	31.8	28.1	29.3	0.13
930218	0700	0.38	0.113	0.113	8.87	8.87	-18.0	-18.0	-21.3	30.6	27.8	24.1	0.17
930218	1000	0.39	0.123	0.132	8.16	7.56	-24.0	-22.0	-19.3	27.3	26.1	24.2	0.14
930218	1300	0.39	0.142	0.142	7.04	7.04	-28.0	-22.0	-15.1	32.5	32.4	48.1	0.15
930218	1600	0.56	0.142	0.142	7.04	7.04	26.0	24.0	16.7	30.2	19.3	10.4	0.12
930218	1900	0.56	0.142	0.142	7.04	7.04	24.0	24.0	18.0	27.5	18.6	10.4	0.13
930218	2200	0.41	0.142	0.142	7.04	7.04	18.0	18.0	4.2	29.5	21.7	14.3	0.14
930219	0100	0.35	0.142	0.142	7.04	7.04	16.0	12.0	3.6	26.5	23.1	16.3	0.17
930219	0400	0.66	0.142	0.142	7.04	7.04	24.0	16.0	16.3	17.6	15.9	12.7	0.13
930219	0700	1.28	0.142	0.142	7.04	7.04	26.0	22.0	21.9	15.5	13.6	13.0	0.09
930219	1000	0.87	0.132	0.142	7.56	7.04	22.0	22.0	20.1	18.2	15.4	14.8	0.09
930219	1300	0.62	0.142	0.142	7.04	7.04	24.0	18.0	18.6	17.5	16.1	14.6	0.11
930219	1600	0.50	0.123	0.132	8.16	7.56	14.0	14.0	10.8	20.3	17.3	14.2	0.16
930219	1900	0.54	0.142	0.142	7.04	7.04	20.0	18.0	10.1	19.0	16.6	10.9	0.15
930219	2200	0.46	0.132	0.142	7.56	7.04	12.0	12.0	10.9	19.2	16.2	12.9	0.14
930220	0100	0.42	0.142	0.142	7.04	7.04	20.0	20.0	10.1	22.8	17.9	11.2	0.15
930220	0400	0.44	0.132	0.142	7.56	7.04	12.0	10.0	8.1	22.8	20.1	17.9	0.16
930220	0700	0.49	0.093	0.103	10.72	9.71	-2.0	-2.0	6.2	22.9	20.7	20.5	0.17
930220	1000	0.57	0.093	0.083	10.72	11.98	-6.0	-4.0	-0.2	20.0	19.3	19.5	0.14
930220	1300	0.68	0.083	0.083	11.98	11.98	-14.0	0.0	-5.4	21.5	21.8	20.5	0.13
930220	1600	0.77	0.093	0.083	10.72	11.98	-8.0	-4.0	-3.3	21.5	21.2	19.1	0.15
930220	1900	0.81	0.083	0.093	11.98	10.72	-10.0	-6.0	-2.8	21.9	21.4	20.6	0.15
930220	2200	0.87	0.083	0.083	11.98	11.98	4.0	2.0	0.0	21.1	20.6	18.6	0.14
930221	0100	0.87	0.093	0.093	10.72	10.72	-12.0	-12.0	-7.5	21.2	20.2	19.4	0.12
930221	0400	0.86	0.093	0.093	10.72	10.72	-10.0	-10.0	-4.6	22.8	22.0	19.8	0.16
930221	0700	0.84	0.083	0.083	11.98	11.98	-12.0	-12.0	-6.6	22.3	21.2	14.1	0.14
930221	1000	0.81	0.083	0.083	11.98	11.98	-12.0	-14.0	-9.4	19.6	19.6	13.2	0.13
930221	1300	0.74	0.083	0.093	11.98	10.72	-16.0	-16.0	-8.9	22.9	23.4	21.2	0.12
930221	1600	0.68	0.093	0.093	10.72	10.72	-4.0	-20.0	-14.8	22.8	23.8	20.3	0.12
930221	1900	0.62	0.093	0.093	10.72	10.72	-10.0	-10.0	-10.0	24.6	24.9	20.4	0.13
930221	2200	0.60	0.093	0.093	10.72	10.72	-18.0	-18.0	-14.8	25.0	23.2	18.6	0.14
930222	0100	0.56	0.132	0.093	7.56	10.72	-40.0	-40.0	-22.5	29.3	19.1	16.3	0.12
930222	0400	0.54	0.132	0.132	7.56	7.56	-40.0	-40.0	-22.9	33.6	20.9	12.8	0.13
930222	0700	0.59	0.123	0.123	8.16	8.16	-40.0	-40.0	-35.4	27.5	18.1	6.9	0.13
930222	1000	0.53	0.113	0.093	8.87	10.72	-38.0	-38.0	-35.5	26.5	20.9	27.0	0.16
930222	1300	0.57	0.103	0.103	9.71	9.71	-34.0	-36.0	-34.8	18.6	15.9	13.2	0.13
930222	1600	0.55	0.103	0.103	9.71	9.71	-36.0	-36.0	-35.2	20.9	15.1	11.0	0.14
930222	1900	0.55	0.093	0.093	10.72	10.72	-34.0	-38.0	-36.6	20.7	16.7	14.1	0.13
930222	2200	0.50	0.113	0.103	8.87	9.71	-38.0	-38.0	-35.7	26.2	21.9	13.3	0.15
930223	0100	0.53	0.093	0.093	10.72	10.72	-30.0	-38.0	-34.5	21.3	16.4	10.1	0.13
930223	0400	0.47	0.123	0.103	8.16	9.71	-38.0	-38.0	-32.0	32.3	24.4	14.9	0.13
930223	0700	0.43	0.103	0.103	9.71	9.71	-36.0	-38.0	-32.7	35.6	25.6	12.4	0.12
930223	1000	0.42	0.113	0.113	8.87	8.87	-36.0	-36.0	-27.8	41.2	37.5	36.5	0.15
930223	1300	0.42	0.113	0.113	8.87	8.87	-36.0	-36.0	-14.8	40.8	38.1	38.0	0.13
930223	1600	0.44	0.123	0.123	8.16	8.16	-36.0	-36.0	-27.4	40.0	37.8	44.0	0.13
930223	1900	0.43	0.123	0.123	8.16	8.16	-34.0	-34.0	-22.4	42.1	40.2	38.8	0.12
930223	2200	0.40	0.113	0.113	8.87	8.87	-38.0	12.0	-11.8	39.3	37.8	40.7	0.14
930224	0100	0.37	0.113	0.103	8.87	9.71	-36.0	-36.0	-18.9	38.1	36.0	43.5	0.15
930224	0400	0.38	0.113	0.103	8.87	9.71	-36.0	8.0	-8.8	35.2	32.5	32.0	0.17
930224	0700	0.36	0.093	0.103	10.72	9.71	6.0	12.0	-10.0	34.1	31.0	30.2	0.14
930224	1000	0.35	0.113	0.103	8.87	9.71	0.0	0.0	-1.4	34.1	31.5	37.6	0.18
930224	1300	0.37	0.103	0.103	9.71	9.71	-32.0	2.0	-11.3	36.2	30.7	31.1	0.15
930224	1600	0.36	0.113	0.083	8.87	11.98	-34.0	10.0	-12.5	36.8	26.6	18.3	0.21
930224	1900	0.35	0.083	0.074	11.98	13.56	4.0	4.0	-11.1	34.7	28.2	16.4	0.18
930224	2200	0.33	0.074	0.083	13.56	11.98	10.0	10.0	-5.5	30.1	26.4	23.1	0.16
930225	0100	0.33	0.142	0.083	7.04	11.98	20.0	10.0	0.5	29.3	25.8	23.0	0.17
930225	0400	0.44	0.142	0.142	7.04	7.04	16.0	10.0	7.4	21.4	18.9	13.6	0.14

(Sheet 24 of 47)



Table A1 (Continued)

Date	Time EST	$N_{\text{me}}$ m	$f_{\text{Ave}}$ Hz	$f_{\text{Ave}}$ Hz	$T_{\text{Ave}}$ sec	$T_{\text{Ave}}$ sec	$\theta_{\text{Ave}}$ deg	$\theta_{\text{Ave}}$ deg	$\theta_{\text{Ave}}$ deg	$\Delta\theta_{\text{me}}$ deg	$\Delta\theta_{\text{me}}$ deg	$\Delta\theta_{\text{me}}$ deg	$\lambda$
930225	0700	0.55	0.142	0.142	7.04	7.04	28.0	14.0	16.7	24.7	20.3	16.1	0.15
930225	1000	0.41	0.142	0.142	7.04	7.04	28.0	24.0	17.1	25.8	22.8	17.8	0.17
930225	1300	0.39	0.142	0.142	7.04	7.04	22.0	10.0	12.4	24.1	22.5	18.1	0.16
930225	1600	0.50	0.132	0.142	7.56	7.04	8.0	8.0	12.2	17.6	17.9	13.7	0.13
930225	1900	0.55	0.142	0.142	7.04	7.04	18.0	20.0	14.9	17.8	17.4	13.4	0.13
930225	2200	0.48	0.142	0.142	7.04	7.04	20.0	18.0	14.2	18.7	18.0	12.1	0.15
930226	0100	0.39	0.142	0.142	7.04	7.04	18.0	18.0	14.0	21.2	20.1	13.0	0.15
930226	0400	0.34	0.142	0.142	7.04	7.04	14.0	8.0	4.1	27.1	21.8	14.3	0.14
930226	0700	0.31	0.142	0.142	7.04	7.04	12.0	14.0	5.1	28.2	23.2	14.4	0.17
930226	1000	0.32	0.142	0.142	7.04	7.04	14.0	14.0	2.9	33.0	27.1	19.3	0.18
930226	1300	0.37	0.142	0.142	7.04	7.04	14.0	14.0	0.2	31.1	23.9	23.2	0.17
930226	1600	0.85	0.142	0.142	7.04	7.04	10.0	14.0	8.0	26.0	25.1	18.7	0.10
930226	1900	1.98	0.132	0.132	7.56	7.56	10.0	12.0	9.1	31.5	30.5	26.3	0.07
930226	2200	2.40	0.123	0.113	8.16	8.87	16.0	16.0	10.9	23.7	24.2	20.4	0.08
930227	0100	2.44	0.103	0.103	9.71	9.71	8.0	6.0	7.8	22.7	21.7	21.0	0.07
930227	0400	2.69	0.103	0.103	9.71	9.71	8.0	-2.0	5.2	18.3	19.1	15.2	0.08
930227	0700	2.81	0.093	0.093	10.72	10.72	2.0	0.0	6.4	18.4	17.1	11.4	0.08
930227	1000	2.70	0.093	0.093	10.72	10.72	-2.0	10.0	2.7	18.8	17.8	15.8	0.09
930227	1300	2.61	0.093	0.093	10.72	10.72	-2.0	2.0	0.9	18.9	18.0	14.9	0.09
930227	1600	2.66	0.093	0.083	10.72	11.98	6.0	6.0	3.9	20.2	19.1	17.1	0.08
930227	1900	2.70	0.083	0.083	11.98	11.98	-4.0	0.0	-1.7	18.4	17.6	15.3	0.09
930227	2200	2.66	0.093	0.083	10.72	11.98	2.0	0.0	-1.7	23.0	21.9	21.9	0.10
930228	0100	2.58	0.074	0.074	13.56	13.56	-6.0	-4.0	-1.8	20.4	19.5	16.0	0.10
930228	0400	2.48	0.083	0.074	11.98	13.56	-6.0	-4.0	-2.2	20.1	20.0	19.7	0.09
930228	0700	2.40	0.083	0.083	11.98	11.98	-4.0	-4.0	-1.2	17.6	16.7	14.5	0.09
930228	1000	2.29	0.074	0.074	13.56	13.56	-6.0	-6.0	2.7	21.7	19.2	16.0	0.10
930228	1300	2.37	0.064	0.074	15.63	13.56	-12.0	-10.0	-3.6	20.6	16.7	19.3	0.10
930228	1600	2.22	0.074	0.074	13.56	13.56	4.0	4.0	-0.2	21.1	19.4	20.3	0.09
930228	1900	2.39	0.074	0.074	13.56	13.56	-4.0	-4.0	-4.3	19.7	18.7	17.8	0.09
930228	2200	2.51	0.074	0.074	13.56	13.56	-6.0	-8.0	-6.1	22.3	21.1	18.9	0.10
930301	0100	2.50	0.064	0.064	15.63	15.63	-10.0	-10.0	-3.5	22.5	21.3	18.7	0.11
930301	0400	2.41	0.064	0.064	15.63	15.63	-14.0	-10.0	0.1	23.9	22.8	24.3	0.10
930301	0700	2.43	0.064	0.064	15.63	15.63	-4.0	-2.0	-4.6	19.7	19.9	19.4	0.10
930301	1000	2.31	0.064	0.064	15.63	15.63	-2.0	4.0	2.5	19.8	20.1	20.5	0.11
930301	1300	2.32	0.064	0.064	15.63	15.63	-6.0	-6.0	-5.3	19.5	19.5	19.4	0.10
930301	1600	2.19	0.064	0.064	15.63	15.63	-6.0	-8.0	-4.1	21.4	20.4	20.0	0.10
930301	1900	2.04	0.064	0.064	15.63	15.63	-14.0	-12.0	-6.6	20.4	19.5	19.2	0.10
930301	2200	2.04	0.064	0.074	15.63	13.56	-10.0	-10.0	-7.6	16.6	16.0	16.4	0.11
930302	0100	1.74	0.074	0.074	13.56	13.56	-8.0	-10.0	-7.9	18.0	16.9	16.7	0.13
930302	0400	1.39	0.064	0.074	15.63	13.56	-12.0	-12.0	-8.3	18.0	16.5	18.2	0.16
930302	0700	1.07	0.074	0.074	13.56	13.56	-14.0	-12.0	-10.0	21.2	21.1	18.7	0.15
930302	1000	1.01	0.074	0.074	13.56	13.56	-14.0	-14.0	-10.5	21.6	18.4	10.7	0.18
930302	1300	0.96	0.083	0.083	11.98	11.98	-8.0	-10.0	-9.9	21.5	20.1	16.6	0.18
930302	1600	0.82	0.074	0.083	13.56	11.98	-10.0	-12.0	-10.9	21.3	20.9	21.1	0.18
930302	1900	0.79	0.083	0.083	11.98	11.98	-10.0	-12.0	-10.7	20.3	19.9	16.6	0.14
930302	2200	0.67	0.083	0.083	11.98	11.98	-10.0	-12.0	-9.5	20.6	20.5	19.1	0.19
930303	0100	0.61	0.083	0.083	11.98	11.98	-12.0	-12.0	-8.5	22.6	22.2	19.4	0.18
930303	0400	0.55	0.093	0.083	10.72	11.98	-14.0	-12.0	-6.9	22.9	22.9	22.6	0.21
930303	0700	0.50	0.093	0.083	10.72	11.98	-12.0	-10.0	-7.5	25.6	25.3	27.6	0.23
930303	1000	0.49	0.083	0.083	11.98	11.98	-4.0	-6.0	-6.2	23.0	22.4	24.6	0.23
930303	1300	0.48	0.083	0.083	11.98	11.98	-14.0	-8.0	-7.6	24.0	23.8	28.6	0.19
930303	1600	0.47	0.083	0.083	11.98	11.98	14.0	-14.0	0.0	25.3	24.5	25.2	0.23
930303	1900	0.44	0.083	0.083	11.98	11.98	-10.0	-10.0	-7.2	23.5	23.2	22.2	0.23
930303	2200	0.46	0.093	0.083	10.72	11.98	-14.0	-12.0	-13.6	22.4	22.9	25.0	0.23
930304	0100	0.46	0.083	0.083	11.98	11.98	-18.0	-14.0	-16.2	23.0	22.8	24.1	0.16
930304	0400	0.46	0.083	0.083	11.98	11.98	-10.0	-12.0	-11.8	23.6	24.1	21.4	0.14
930304	0700	0.58	0.123	0.083	8.16	11.98	-42.0	-42.0	-25.8	38.4	20.8	29.3	0.13
930304	1000	0.85	0.132	0.132	7.56	7.56	-42.0	-40.0	-33.4	28.7	17.5	10.4	0.11

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Table A1 (Continued)

Date	Time EST	$N_{ms}$ m	$f_{A,ms}$ Hz	$f_{A,ms}$ Hz	$T_{A,ms}$ sec	$T_{A,ms}$ sec	$\theta_{A,ms}$ deg	$\theta_{A,ms}$ deg	$\theta_{A,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\lambda$
930304	1300	1.19	0.113	0.113	8.87	8.87	-38.0	-38.0	-34.8	19.3	17.9	7.0	0.11
930304	1600	1.09	0.113	0.113	8.87	8.87	-38.0	-38.0	-34.9	37.6	33.0	16.2	0.12
930304	1900	1.01	0.132	0.123	7.56	8.16	24.0	-36.0	-9.1	44.9	41.3	50.8	0.11
930304	2200	1.11	0.093	0.113	10.72	8.87	-32.0	-32.0	-15.8	42.6	39.5	42.6	0.10
930305	0100	1.12	0.093	0.113	10.72	8.87	-36.0	-36.0	-9.7	43.7	39.2	43.7	0.11
930305	0400	1.10	0.113	0.103	8.87	9.71	14.0	12.0	0.2	44.4	43.3	49.5	0.13
930305	0700	1.09	0.103	0.103	9.71	9.71	20.0	10.0	11.3	38.9	38.2	38.0	0.12
930305	1000	1.06	0.103	0.103	9.71	9.71	16.0	10.0	11.6	32.4	34.1	39.4	0.10
930305	1300	1.03	0.093	0.103	10.72	9.71	10.0	10.0	11.5	28.2	29.8	29.5	0.13
930305	1600	1.01	0.093	0.093	10.72	10.72	0.0	12.0	7.6	31.3	33.2	21.4	0.15
930305	1900	0.87	0.103	0.103	9.71	9.71	16.0	16.0	13.2	32.6	34.1	29.2	0.17
930305	2200	0.85	0.103	0.103	9.71	9.71	12.0	12.0	4.9	28.5	31.5	27.8	0.12
930306	0100	0.87	0.103	0.103	9.71	9.71	16.0	14.0	10.1	27.8	32.7	23.1	0.16
930306	0400	0.89	0.093	0.093	10.72	10.72	10.0	10.0	-1.2	20.8	28.9	15.8	0.20
930306	0700	0.90	0.093	0.093	10.72	10.72	0.0	0.0	7.2	19.1	22.6	15.2	0.20
930306	1000	0.93	0.093	0.093	10.72	10.72	14.0	12.0	10.8	16.9	18.2	15.9	0.14
930306	1300	0.97	0.093	0.093	10.72	10.72	2.0	4.0	7.3	18.1	20.7	14.7	0.14
930306	1600	0.84	0.093	0.093	10.72	10.72	4.0	4.0	6.1	21.6	24.2	14.2	0.19
930306	1900	0.84	0.093	0.083	10.72	11.98	-2.0	-2.0	8.6	23.2	23.9	22.0	0.19
930306	2200	0.82	0.083	0.083	11.98	11.98	-2.0	2.0	4.6	20.2	19.2	18.2	0.12
930307	0100	0.85	0.083	0.093	11.98	10.72	4.0	2.0	3.9	17.0	17.4	16.9	0.15
930307	0400	0.84	0.093	0.083	10.72	11.98	6.0	4.0	2.3	19.8	20.6	20.6	0.20
930307	0700	0.77	0.083	0.083	11.98	11.98	6.0	0.0	0.9	19.7	20.6	18.5	0.23
930307	1000	0.80	0.083	0.083	11.98	11.98	-6.0	4.0	-1.1	20.6	20.8	18.4	0.15
930307	1300	0.78	0.083	0.083	11.98	11.98	-2.0	-2.0	1.5	23.0	22.3	21.2	0.15
930307	1600	0.76	0.083	0.083	11.98	11.98	2.0	2.0	2.6	22.6	22.6	22.4	0.20
930307	1900	0.77	0.083	0.083	11.98	11.98	-6.0	-10.0	-4.4	20.5	21.4	18.8	0.23
930307	2200	0.77	0.074	0.074	13.56	13.56	-12.0	-10.0	-6.8	20.1	21.4	18.1	0.17
930308	0100	0.77	0.074	0.083	13.56	11.98	-8.0	-10.0	-11.8	19.9	20.5	21.2	0.15
930308	0400	0.68	0.074	0.074	13.56	13.56	-14.0	-12.0	-11.9	23.0	23.6	21.3	0.22
930308	0700	0.61	0.074	0.074	13.56	13.56	2.0	-2.0	-2.1	23.3	23.5	21.0	0.23
930308	1000	0.53	0.083	0.083	11.98	11.98	-12.0	-12.0	-12.6	25.5	25.6	22.9	0.22
930308	1300	0.50	0.083	0.083	11.98	11.98	0.0	-4.0	-6.3	24.3	22.6	23.9	0.18
930308	1600	0.44	0.083	0.083	11.98	11.98	-4.0	-4.0	-7.6	28.3	25.3	21.8	0.28
930308	1900	0.40	0.083	0.083	11.98	11.98	-4.0	-6.0	-12.0	32.4	24.1	21.6	0.20
930308	2200	0.39	0.083	0.083	11.98	11.98	-18.0	-18.0	-20.8	35.9	23.2	24.8	0.25
930309	0100	0.37	0.132	0.083	7.56	11.98	-42.0	-42.0	-26.4	34.4	21.5	21.6	0.15
930309	0400	0.34	0.132	0.083	7.56	11.98	-40.0	-40.0	-16.7	44.9	21.5	26.8	0.25
930309	0700	0.29	0.132	0.083	7.56	11.98	-44.0	-42.0	-15.8	43.5	20.1	23.1	0.23
930309	1000	0.27	0.132	0.083	7.56	11.98	-42.0	-42.0	-23.2	38.0	22.2	26.0	0.26
930309	1300	0.26	0.132	0.083	7.56	11.98	-42.0	-40.0	-24.5	33.0	21.3	30.8	0.20
930309	1600	0.24	0.123	0.093	8.16	10.72	-38.0	-40.0	-20.0	31.7	19.6	18.9	0.33
930309	1900	0.21	0.132	0.093	7.56	10.72	-42.0	-42.0	-25.8	32.3	20.5	21.6	0.23
930309	2200	0.19	0.132	0.083	7.56	11.98	-42.0	-34.0	-24.2	27.4	21.2	21.1	0.28
930310	0100	0.18	0.132	0.093	7.56	10.72	-40.0	-26.0	-23.9	29.5	23.5	25.2	0.24
930310	0400	0.18	0.142	0.093	7.04	10.72	-40.0	-38.0	-26.0	33.1	28.3	24.1	0.33
930310	0700	0.17	0.074	0.074	13.56	13.56	-8.0	-12.0	-22.6	29.8	25.7	19.2	0.32
930310	1900	0.28	0.132	0.142	7.56	7.04	-42.0	-42.0	-37.6	15.3	12.2	8.8	0.19
930310	2200	0.39	0.132	0.132	7.56	7.56	-44.0	-44.0	-40.5	11.1	9.5	5.1	0.19
930311	0100	0.39	0.132	0.132	7.56	7.56	-44.0	-42.0	-39.3	17.1	12.7	6.6	0.16
930311	0400	0.38	0.132	0.132	7.56	7.56	-44.0	-42.0	-39.0	16.5	13.4	7.6	0.14
930311	0700	0.39	0.123	0.123	8.16	8.16	-42.0	-42.0	-40.8	14.3	12.5	9.6	0.17
930311	1000	0.35	0.113	0.113	8.87	8.87	-42.0	-42.0	-40.0	18.6	16.0	10.1	0.18
930311	1300	0.35	0.113	0.113	8.87	8.87	-40.0	-40.0	-39.5	23.7	23.3	16.1	0.18
930311	1600	0.33	0.123	0.123	8.16	8.16	-42.0	-38.0	-37.3	24.6	21.2	17.3	0.18
930311	1900	0.32	0.123	0.123	8.16	8.16	-42.0	-42.0	-38.7	25.6	18.3	12.3	0.17
930311	2200	0.30	0.132	0.123	7.56	8.16	-42.0	-42.0	-34.4	35.0	24.6	16.1	0.15

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{A,0}$ Hz	$f_{A,1}$ Hz	$T_{A,0}$ sec	$T_{A,1}$ sec	$\theta_{A,0}$ deg	$\theta_{A,1}$ deg	$\theta_{A,2}$ deg	$\Delta\theta_{01}$ deg	$\Delta\theta_{02}$ deg	$\Delta\theta_{12}$ deg	$\chi$
930312	0100	0.28	0.132	0.132	7.56	7.56	-44.0	-40.0	-32.9	40.1	38.7	41.1	0.16
930312	0400	0.32	0.142	0.142	7.04	7.04	18.0	12.0	-5.0	43.4	39.4	39.5	0.16
930312	0700	0.35	0.142	0.142	7.04	7.04	16.0	14.0	8.3	37.7	31.1	19.1	0.16
930312	1000	0.33	0.142	0.142	7.04	7.04	16.0	16.0	-0.7	44.9	33.9	17.4	0.16
930312	1300	0.39	0.142	0.142	7.04	7.04	12.0	12.0	8.2	35.1	29.8	16.1	0.14
930312	1600	0.45	0.142	0.142	7.04	7.04	12.0	10.0	6.3	24.0	19.3	11.2	0.12
930312	1900	0.36	0.142	0.142	7.04	7.04	14.0	14.0	2.6	35.2	24.7	15.7	0.17
930312	2200	0.34	0.142	0.142	7.04	7.04	16.0	-28.0	-10.6	38.0	33.0	36.0	0.20
930313	0100	0.78	0.142	0.142	7.04	7.04	-14.0	-14.0	-10.5	31.2	30.4	31.6	0.11
930313	0400	1.96	0.132	0.132	7.56	7.56	4.0	-16.0	-3.2	27.7	23.1	23.5	0.07
930313	0700	2.72	0.103	0.103	9.71	9.71	-34.0	-34.0	-27.9	22.1	22.3	13.7	0.08
930313	1000	3.19	0.093	0.093	10.72	10.72	-34.0	-34.0	-31.7	18.0	19.8	16.4	0.11
930313	1300	3.10	0.083	0.083	11.98	11.98	-30.0	-30.0	-26.7	17.8	18.1	14.5	0.13
930313	1900	2.54	0.083	0.074	11.98	13.56	-30.0	-30.0	-27.5	15.4	14.8	16.4	0.11
930313	2200	2.13	0.064	0.074	15.63	13.56	-26.0	-26.0	-26.0	12.0	12.2	11.2	0.12
930314	0100	1.75	0.064	0.064	15.63	15.63	-26.0	-28.0	-27.2	12.4	12.5	11.8	0.15
930314	0400	1.41	0.064	0.064	15.63	15.63	-24.0	-26.0	-26.1	15.3	15.2	15.3	0.13
930314	0700	1.20	0.064	0.064	15.63	15.63	-24.0	-24.0	-24.2	11.6	12.9	9.5	0.13
930314	1000	0.89	0.074	0.074	13.56	13.56	-24.0	-28.0	-27.1	16.9	17.7	18.2	0.16
930314	1300	0.67	0.074	0.074	13.56	13.56	-28.0	-30.0	-28.2	19.2	19.4	18.0	0.18
930314	1900	0.51	0.083	0.083	11.98	11.98	-28.0	-28.0	-23.9	27.1	24.9	17.6	0.17
930314	2200	0.47	0.083	0.083	11.98	11.98	-30.0	-30.0	-24.9	31.7	27.8	17.8	0.17
930315	0100	0.47	0.074	0.074	13.56	13.56	-8.0	10.0	-4.8	34.3	30.5	27.8	0.18
930315	0400	0.48	0.074	0.083	13.56	11.98	-4.0	-4.0	-3.7	30.5	25.1	27.7	0.20
930315	0700	0.51	0.142	0.142	7.04	7.04	22.0	-4.0	3.8	28.6	22.6	13.8	0.17
930315	1000	0.53	0.142	0.142	7.04	7.04	26.0	16.0	2.0	31.2	22.1	15.9	0.18
930315	1300	0.52	0.132	0.074	7.56	13.56	16.0	14.0	-0.1	29.3	23.9	21.0	0.18
930315	1600	0.49	0.064	0.064	15.63	15.63	6.0	8.0	3.8	27.4	23.2	19.6	0.15
930315	1900	0.45	0.064	0.074	15.63	13.56	-14.0	-14.0	-4.4	26.7	23.2	22.5	0.14
930315	2200	0.43	0.064	0.074	15.63	13.56	-16.0	-14.0	0.1	29.0	22.7	23.2	0.18
930316	0100	0.46	0.123	0.123	8.16	8.16	14.0	12.0	1.6	25.6	19.5	15.7	0.16
930316	0400	0.49	0.132	0.132	7.56	7.56	4.0	4.0	-0.2	21.0	18.5	11.5	0.16
930316	0700	0.42	0.142	0.142	7.04	7.04	8.0	-10.0	-5.0	25.1	19.5	12.7	0.14
930316	1000	0.36	0.093	0.074	10.72	13.56	-12.0	-12.0	-10.6	24.4	23.0	20.3	0.18
930316	1300	0.37	0.083	0.083	11.98	11.98	-12.0	-10.0	-18.4	25.9	24.5	21.4	0.18
930316	1600	0.38	0.093	0.083	10.72	11.98	-12.0	-10.0	-16.7	24.8	22.8	20.1	0.15
930316	1900	0.37	0.093	0.103	10.72	9.71	-10.0	-10.0	-12.9	23.5	22.3	20.0	0.15
930316	2200	0.35	0.093	0.103	10.72	9.71	-12.0	-12.0	-11.4	20.2	19.5	17.7	0.18
930317	0100	0.35	0.103	0.103	9.71	9.71	-14.0	-10.0	-13.0	19.6	19.3	18.1	0.22
930317	0400	0.39	0.142	0.142	7.04	7.04	-34.0	-12.0	-18.7	22.4	20.4	21.3	0.19
930317	0700	0.46	0.142	0.142	7.04	7.04	-36.0	-12.0	-21.2	23.5	21.2	20.8	0.14
930317	1000	0.59	0.142	0.142	7.04	7.04	-36.0	-32.0	-27.3	23.3	21.2	20.3	0.13
930317	1300	0.69	0.142	0.142	7.04	7.04	-36.0	-24.0	-26.4	23.4	19.9	21.0	0.13
930317	1600	0.86	0.142	0.142	7.04	7.04	-36.0	-36.0	-26.4	22.2	16.7	12.4	0.12
930317	1900	0.88	0.132	0.132	7.56	7.56	-32.0	-30.0	-26.0	20.4	16.0	14.3	0.11
930317	2200	0.69	0.123	0.123	8.16	8.16	-32.0	-32.0	-28.4	22.9	20.1	21.4	0.12
930318	0100	0.91	0.142	0.142	7.04	7.04	36.0	36.0	18.3	52.4	28.6	9.8	0.12
930318	0400	1.86	0.142	0.142	7.04	7.04	32.0	26.0	22.8	21.0	16.8	12.8	0.08
930318	0700	1.97	0.132	0.132	7.56	7.56	28.0	26.0	25.2	21.9	19.4	16.3	0.07
930318	1000	1.92	0.123	0.123	8.16	8.16	20.0	16.0	12.9	21.7	19.3	19.2	0.08
930318	1300	1.88	0.103	0.103	9.71	9.71	8.0	10.0	13.7	19.2	18.7	11.7	0.08
930318	1600	1.65	0.093	0.093	10.72	10.72	10.0	10.0	12.6	20.7	19.9	14.9	0.09
930318	1900	1.45	0.103	0.103	9.71	9.71	10.0	10.0	12.2	22.6	20.9	21.3	0.09
930318	2200	1.60	0.142	0.142	7.04	7.04	20.0	14.0	8.9	21.6	18.9	16.0	0.08
930319	0100	1.86	0.103	0.103	9.71	9.71	2.0	6.0	9.0	20.3	21.3	21.3	0.08
930319	0400	1.80	0.103	0.093	9.71	10.72	6.0	6.0	7.3	23.7	22.6	19.8	0.09
930319	0700	1.71	0.103	0.103	9.71	9.71	2.0	2.0	7.5	28.7	27.2	28.8	0.10
930319	1000	1.72	0.093	0.093	10.72	10.72	6.0	8.0	3.0	25.1	24.5	23.5	0.09

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{APD}$ Hz	$f_{APD}$ Hz	$T_{APD}$ sec	$T_{APD}$ sec	$\theta_{APD}$ deg	$\theta_{APD}$ deg	$\theta_{APD}$ deg	$\Delta\theta_{APD}$ deg	$\Delta\theta_{APD}$ deg	$\Delta\theta_{APD}$ deg	$X$
930319	1300	1.80	0.093	0.103	10.72	9.71	-12.0	0.0	-2.6	24.0	22.6	24.6	0.08
930319	1600	1.79	0.093	0.093	10.72	10.72	-16.0	-14.0	-6.6	23.0	22.7	23.6	0.10
930319	1900	1.75	0.083	0.093	11.98	10.72	-10.0	-8.0	-3.1	22.4	20.2	19.8	0.10
930319	2200	1.72	0.083	0.093	11.98	10.72	-10.0	-12.0	-4.9	23.8	22.3	23.6	0.09
930320	0100	1.84	0.083	0.083	11.98	11.98	-12.0	-12.0	-3.8	20.1	19.0	10.9	0.09
930320	0400	1.77	0.083	0.083	11.98	11.98	-14.0	-14.0	-5.9	21.4	18.9	12.5	0.10
930320	0700	1.77	0.093	0.083	10.72	11.98	-12.0	-12.0	-6.5	22.2	21.0	16.7	0.09
930320	1000	1.63	0.083	0.083	11.98	11.98	-10.0	-10.0	-3.9	21.7	20.3	14.0	0.09
930320	1300	1.54	0.093	0.093	10.72	10.72	-18.0	-22.0	-5.0	26.2	25.6	23.8	0.09
930320	1600	1.49	0.093	0.093	10.72	10.72	-6.0	-10.0	-7.8	23.3	22.8	18.6	0.13
930320	1900	1.34	0.083	0.093	11.98	10.72	-8.0	-10.0	-4.4	22.7	22.2	20.2	0.12
930320	2200	1.24	0.083	0.093	11.98	10.72	-14.0	-10.0	-8.5	20.0	19.6	20.8	0.10
930321	0100	1.17	0.093	0.093	10.72	10.72	-18.0	-20.0	-6.6	25.6	25.3	24.4	0.10
930321	0400	1.08	0.093	0.093	10.72	10.72	-12.0	-12.0	-4.5	25.7	25.5	22.8	0.13
930321	0700	1.07	0.093	0.093	10.72	10.72	-16.0	-12.0	-6.4	27.2	26.8	26.6	0.12
930321	1000	1.07	0.093	0.093	10.72	10.72	-18.0	-18.0	-6.4	25.3	23.8	21.2	0.10
930321	1300	1.00	0.103	0.103	9.71	9.71	-16.0	-16.0	-9.2	27.0	26.8	23.0	0.11
930321	1600	1.00	0.093	0.093	10.72	10.72	-8.0	-12.0	-9.0	26.9	26.3	24.5	0.14
930321	1900	0.91	0.093	0.093	10.72	10.72	-14.0	-14.0	-13.8	27.2	25.4	17.8	0.12
930321	2200	0.89	0.093	0.093	10.72	10.72	-14.0	-14.0	-10.6	24.7	23.5	19.8	0.13
930322	0100	0.91	0.093	0.093	10.72	10.72	-16.0	-16.0	-12.1	28.6	28.1	30.3	0.12
930322	0400	0.87	0.093	0.093	10.72	10.72	-16.0	-16.0	-15.6	27.3	26.1	20.4	0.14
930322	0700	0.86	0.093	0.093	10.72	10.72	-12.0	-18.0	-16.4	23.5	23.6	20.6	0.14
930322	1000	0.78	0.093	0.093	10.72	10.72	-24.0	-24.0	-23.1	28.6	28.7	26.4	0.13
930322	1300	0.81	0.093	0.093	10.72	10.72	-20.0	-18.0	-21.4	25.0	25.3	20.4	0.11
930322	1600	0.78	0.083	0.083	11.98	11.98	-6.0	-24.0	-13.8	26.3	25.8	19.9	0.13
930322	1900	0.75	0.083	0.093	11.98	10.72	-14.0	-14.0	-11.3	26.5	25.4	22.2	0.14
930322	2200	0.69	0.093	0.093	10.72	10.72	-16.0	-16.0	-9.0	27.4	27.1	26.3	0.14
930323	0100	0.70	0.093	0.093	10.72	10.72	-10.0	-10.0	-12.6	23.2	22.8	21.5	0.11
930323	0400	0.65	0.093	0.093	10.72	10.72	0.0	-22.0	-15.1	25.4	25.0	26.2	0.13
930323	0700	0.63	0.093	0.093	10.72	10.72	-2.0	-16.0	-16.8	26.4	26.5	20.3	0.15
930323	1000	0.63	0.083	0.083	11.98	11.98	-14.0	-16.0	-18.5	23.6	23.4	16.7	0.16
930323	1300	0.62	0.083	0.093	11.98	10.72	-18.0	-18.0	-14.4	23.1	22.8	19.9	0.13
930323	1600	0.62	0.083	0.093	11.98	10.72	-12.0	-14.0	-18.0	21.3	21.5	23.8	0.14
930323	1900	0.63	0.083	0.093	11.98	10.72	-18.0	-16.0	-20.0	22.4	22.3	24.8	0.15
930323	2200	0.58	0.093	0.093	10.72	10.72	-20.0	-18.0	-19.2	21.0	21.3	21.0	0.16
930324	0100	0.58	0.093	0.093	10.72	10.72	-14.0	-16.0	-15.4	20.2	20.1	21.0	0.14
930324	0400	0.57	0.093	0.093	10.72	10.72	-22.0	-16.0	-19.1	20.6	20.2	24.3	0.16
930324	0700	0.64	0.142	0.142	7.04	7.04	-20.0	-20.0	-17.5	19.6	18.9	15.5	0.17
930324	1300	0.59	0.142	0.142	7.04	7.04	-38.0	-14.0	-21.4	22.0	21.8	22.7	0.15
930324	1600	0.59	0.142	0.142	7.04	7.04	-38.0	-14.0	-20.9	22.8	22.5	20.8	0.16
930324	1900	0.63	0.142	0.142	7.04	7.04	-42.0	-42.0	-28.8	30.4	22.9	20.5	0.20
930324	2200	0.62	0.142	0.142	7.04	7.04	-42.0	-40.0	-29.5	29.0	22.5	23.1	0.20
930325	0100	0.54	0.142	0.142	7.04	7.04	-42.0	-12.0	-24.5	28.5	22.8	22.6	0.18
930325	0400	0.51	0.142	0.142	7.04	7.04	-38.0	-32.0	-23.6	29.5	25.3	31.4	0.18
930325	0700	0.54	0.142	0.142	7.04	7.04	-40.0	-40.0	-27.1	42.8	40.2	66.1	0.17
930325	1000	0.61	0.142	0.142	7.04	7.04	30.0	28.0	6.0	50.8	35.9	25.0	0.16
930325	1300	0.65	0.142	0.142	7.04	7.04	24.0	24.0	9.3	43.9	33.3	28.3	0.14
930325	1600	0.68	0.142	0.142	7.04	7.04	24.0	24.0	14.2	36.8	25.0	21.0	0.14
930325	1900	0.68	0.142	0.142	7.04	7.04	28.0	26.0	13.4	32.0	23.3	20.1	0.17
930325	2200	0.64	0.132	0.132	7.56	7.56	22.0	12.0	8.4	30.4	23.4	22.7	0.18
930326	0100	0.66	0.132	0.132	7.56	7.56	26.0	10.0	14.2	26.8	23.0	22.0	0.17
930326	0400	0.62	0.132	0.132	7.56	7.56	10.0	10.0	4.7	26.0	22.6	20.2	0.16
930326	0700	0.57	0.142	0.142	7.04	7.04	28.0	4.0	9.3	29.5	23.5	27.7	0.21
930326	1000	0.54	0.132	0.132	7.56	7.56	12.0	10.0	5.1	25.9	19.1	12.5	0.20
930326	1300	0.50	0.132	0.132	7.56	7.56	10.0	10.0	6.7	28.8	23.3	17.5	0.18
930326	1900	0.42	0.142	0.142	7.04	7.04	6.0	6.0	-2.8	32.3	29.7	21.9	0.22
930326	2200	0.42	0.142	0.142	7.04	7.04	16.0	-4.0	-7.4	33.0	29.0	25.7	0.20

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{A,0}$ Hz	$f_{A,10}$ Hz	$T_{A,0}$ sec	$T_{A,10}$ sec	$\theta_{A,0}$ deg	$\theta_{A,10}$ deg	$\theta_{A,20}$ deg	$\Delta\theta_{A,0}$ deg	$\Delta\theta_{A,10}$ deg	$\Delta\theta_{A,20}$ deg	$\chi$
930327	0100	0.41	0.142	0.142	7.04	7.04	-30.0	-28.0	-22.3	35.6	33.5	41.6	0.20
930327	0400	0.44	0.142	0.142	7.04	7.04	-16.0	-16.0	-17.8	30.5	28.4	25.1	0.17
930327	0700	0.54	0.142	0.142	7.04	7.04	-18.0	-30.0	-18.6	30.7	26.3	25.1	0.17
930327	1000	0.76	0.142	0.142	7.04	7.04	-32.0	-34.0	-29.1	25.5	23.2	20.9	0.13
930327	1300	1.03	0.132	0.132	7.56	7.56	-36.0	-36.0	-34.9	21.4	21.2	18.5	0.11
930327	1600	1.16	0.132	0.132	7.56	7.56	-24.0	-22.0	-21.1	22.1	21.5	20.7	0.11
930327	1900	1.04	0.142	0.132	7.04	7.56	-40.0	-38.0	-24.5	29.0	27.5	24.9	0.15
930327	2200	0.87	0.132	0.132	7.56	7.56	-40.0	-40.0	-35.3	30.3	26.9	23.7	0.17
930328	0100	0.81	0.132	0.132	7.56	7.56	-38.0	-38.0	-29.3	25.9	22.9	20.2	0.14
930328	0400	0.72	0.132	0.132	7.56	7.56	-22.0	-22.0	-21.7	26.4	24.5	23.7	0.13
930328	0700	0.67	0.142	0.132	7.04	7.56	-38.0	-16.0	-17.6	29.6	23.7	24.7	0.16
930328	1000	0.61	0.142	0.132	7.04	7.56	-38.0	-12.0	-21.7	31.0	25.3	27.0	0.17
930328	1300	0.50	0.132	0.132	7.56	7.56	-40.0	-40.0	-25.2	34.8	30.9	36.9	0.20
930328	1600	0.44	0.123	0.132	8.16	7.56	-2.0	-2.0	-13.0	29.0	27.6	29.7	0.18
930328	1900	0.40	0.142	0.142	7.04	7.04	-40.0	-8.0	-21.8	30.4	26.4	31.2	0.18
930328	2200	0.37	0.123	0.142	8.16	7.04	-2.0	-2.0	-21.0	33.3	29.4	33.7	0.18
930329	0100	0.35	0.142	0.142	7.04	7.04	-36.0	0.0	-18.6	32.3	30.3	35.2	0.24
930329	0400	0.32	0.142	0.142	7.04	7.04	-40.0	-10.0	-12.2	31.4	30.5	38.5	0.25
930329	0700	0.30	0.142	0.142	7.04	7.04	-38.0	-36.0	-29.7	32.8	31.7	32.8	0.22
930329	1000	0.31	0.132	0.132	7.56	7.56	-2.0	-4.0	-14.6	33.2	33.2	32.8	0.21
930329	1300	0.32	0.142	0.132	7.04	7.56	-10.0	-14.0	-18.4	31.7	31.2	30.7	0.24
930329	1600	0.32	0.132	0.132	7.56	7.56	-12.0	-12.0	-12.6	28.3	28.3	21.9	0.22
930329	1900	0.34	0.123	0.123	8.16	8.16	-36.0	-16.0	-13.3	33.4	31.9	32.5	0.21
930329	2200	0.35	0.113	0.113	8.87	8.87	-26.0	-4.0	-12.7	34.3	31.7	29.5	0.19
930330	0100	0.35	0.093	0.123	10.72	8.16	10.0	2.0	-9.9	34.0	30.9	31.7	0.23
930330	0400	0.33	0.103	0.123	9.71	8.16	8.0	-26.0	-10.9	35.2	34.1	37.0	0.28
930330	0700	0.32	0.113	0.123	8.87	8.16	2.0	-22.0	-4.3	33.1	33.1	31.4	0.24
930330	1000	0.31	0.103	0.123	9.71	8.16	8.0	8.0	2.6	36.6	36.7	34.3	0.21
930330	1300	0.30	0.123	0.113	8.16	8.87	-24.0	6.0	-2.3	35.2	34.6	37.9	0.23
930330	1600	0.31	0.123	0.123	8.16	8.16	0.0	0.0	-4.4	33.0	30.9	22.3	0.27
930330	1900	0.32	0.113	0.113	8.87	8.87	-2.0	-2.0	-5.7	32.4	31.5	29.7	0.23
930330	2200	0.33	0.113	0.113	8.87	8.87	4.0	4.0	-4.6	32.2	30.6	31.2	0.17
930331	0100	0.34	0.113	0.113	8.87	8.87	-10.0	14.0	-3.2	33.1	28.8	30.9	0.19
930331	0400	0.35	0.113	0.113	8.87	8.87	6.0	4.0	3.5	29.8	28.4	29.5	0.25
930331	0700	0.36	0.113	0.113	8.87	8.87	-24.0	4.0	-7.3	31.9	30.4	27.6	0.21
930331	1000	0.44	0.123	0.123	8.16	8.16	-18.0	2.0	-4.3	28.6	28.1	28.9	0.20
930331	1300	0.54	0.113	0.113	8.87	8.87	10.0	10.0	3.1	23.5	23.5	23.1	0.22
930331	1600	0.53	0.123	0.123	8.16	8.16	8.0	14.0	3.8	24.9	24.8	22.7	0.21
930331	1900	0.52	0.142	0.142	7.04	7.04	14.0	4.0	5.6	24.3	23.1	20.4	0.15
930331	2200	0.50	0.142	0.142	7.04	7.04	12.0	10.0	5.8	24.2	24.2	22.9	0.19
930401	0100	0.48	0.142	0.113	7.04	8.87	8.0	6.0	7.0	27.9	28.4	28.9	0.17
930401	0400	0.54	0.123	0.123	8.16	8.16	0.0	2.0	-4.9	31.0	31.2	19.1	0.19
930401	0700	0.68	0.142	0.123	7.04	8.16	-40.0	4.0	-17.6	38.9	31.5	25.8	0.13
930401	1000	0.66	0.113	0.123	8.87	8.16	-18.0	-18.0	-7.5	33.6	36.7	40.1	0.16
930401	1300	0.68	0.132	0.113	7.56	8.87	-44.0	0.0	-16.7	37.2	37.3	25.4	0.16
930401	1600	0.67	0.123	0.123	8.16	8.16	-42.0	2.0	-21.3	43.1	39.3	48.8	0.19
930401	1900	0.65	0.113	0.113	8.87	8.87	8.0	6.0	-16.0	40.0	36.9	41.9	0.16
930401	2200	0.65	0.123	0.113	8.16	8.87	-40.0	-40.0	-20.7	45.2	33.3	40.5	0.16
930402	0100	0.68	0.123	0.103	8.16	9.71	-40.0	2.0	-12.9	39.3	33.7	23.4	0.20
930402	0400	0.71	0.113	0.093	8.87	10.72	4.0	2.0	-12.6	39.5	36.0	29.1	0.22
930402	0700	0.71	0.103	0.093	9.71	10.72	6.0	-42.0	-21.6	45.8	42.2	25.0	0.17
930402	1000	0.74	0.113	0.103	8.87	9.71	-40.0	-42.0	-20.5	49.0	44.3	39.7	0.16
930402	1300	0.72	0.103	0.103	9.71	9.71	2.0	4.0	-18.3	42.8	41.7	35.0	0.20
930402	1600	0.70	0.103	0.103	9.71	9.71	8.0	10.0	-6.0	42.2	34.3	27.2	0.23
930402	1900	0.67	0.103	0.103	9.71	9.71	-4.0	16.0	0.8	38.4	38.5	26.4	0.19
930402	2200	0.65	0.103	0.103	9.71	9.71	10.0	4.0	-5.3	37.2	34.6	22.4	0.14
930403	0100	0.61	0.113	0.113	8.87	8.87	2.0	2.0	-1.8	41.9	42.6	45.9	0.23
930403	0400	0.55	0.113	0.113	8.87	8.87	6.0	6.0	0.3	35.9	37.1	33.5	0.23

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{A/B}$ Hz	$f_{A/B}$ Hz	$T_{A/B}$ sec	$T_{A/B}$ sec	$\theta_{A/B}$ deg	$\theta_{A/B}$ deg	$\theta_{A/B}$ deg	$\Delta\theta_{AB}$ deg	$\Delta\theta_{AB}$ deg	$\Delta\theta_{AB}$ deg	$X$
930403	0700	0.50	0.103	0.103	9.71	9.71	10.0	4.0	-10.6	40.6	40.1	22.0	0.19
930403	1000	0.47	0.103	0.113	9.71	8.87	12.0	10.0	10.1	30.0	33.6	30.6	0.16
930403	1300	0.48	0.123	0.123	8.16	8.16	6.0	6.0	6.4	26.3	27.4	27.9	0.17
930403	1600	0.46	0.113	0.123	8.87	8.16	8.0	8.0	5.1	25.8	25.7	25.3	0.19
930403	1900	0.42	0.113	0.123	8.87	8.16	10.0	8.0	7.7	28.1	31.1	45.1	0.21
930403	2200	0.40	0.142	0.103	7.04	9.71	10.0	8.0	2.7	27.0	29.4	20.9	0.17
930404	0100	0.39	0.103	0.103	9.71	9.71	4.0	2.0	3.8	26.9	28.2	14.6	0.18
930404	0400	0.42	0.113	0.113	8.87	8.87	4.0	6.0	0.3	30.1	31.7	21.9	0.19
930404	0700	0.40	0.113	0.113	8.87	8.87	8.0	8.0	1.5	29.3	30.2	25.6	0.22
930404	1000	0.37	0.113	0.123	8.87	8.16	2.0	0.0	4.5	24.5	24.4	27.2	0.18
930404	1300	0.39	0.113	0.113	8.87	8.87	-4.0	-4.0	0.4	25.2	26.1	21.8	0.18
930404	1600	0.43	0.113	0.113	8.87	8.87	4.0	4.0	2.3	28.6	29.3	23.1	0.19
930404	1900	0.42	0.113	0.113	8.87	8.87	6.0	6.0	-5.0	29.3	28.7	27.2	0.19
930404	2200	0.38	0.123	0.123	8.16	8.16	-20.0	-18.0	-4.6	29.5	28.2	28.7	0.16
930405	0100	0.38	0.113	0.113	8.87	8.87	-14.0	-14.0	-14.7	22.9	22.4	20.6	0.19
930405	0400	0.38	0.123	0.123	8.16	8.16	-18.0	-16.0	-15.1	20.7	20.3	21.7	0.18
930405	0700	0.36	0.103	0.113	9.71	8.87	-12.0	-16.0	-15.3	21.0	21.3	18.4	0.18
930405	1000	0.35	0.113	0.123	8.87	8.16	-16.0	-16.0	-15.5	21.3	20.9	18.6	0.19
930405	1300	0.37	0.113	0.113	8.87	8.87	-18.0	-18.0	-18.2	23.3	23.3	18.4	0.18
930405	1600	0.39	0.123	0.123	8.16	8.16	-16.0	-16.0	-17.3	28.9	27.2	23.1	0.22
930405	1900	0.45	0.142	0.142	7.04	7.04	-26.0	-24.0	-19.9	26.6	23.4	15.9	0.18
930405	2200	0.68	0.142	0.142	7.04	7.04	-20.0	-20.0	-18.9	20.8	21.0	15.6	0.12
930406	0100	1.11	0.142	0.142	7.04	7.04	-6.0	-24.0	-15.1	25.7	22.9	23.8	0.10
930406	0400	1.49	0.132	0.142	7.56	7.04	-18.0	-20.0	-12.8	27.3	23.6	25.5	0.10
930406	0700	2.18	0.123	0.123	8.16	8.16	2.0	2.0	-10.7	34.0	22.8	24.5	0.09
930406	1000	2.47	0.093	0.113	10.72	8.87	-30.0	-28.0	-7.6	32.5	22.8	26.7	0.07
930406	1300	2.88	0.103	0.103	9.71	9.71	-22.0	-22.0	-12.5	29.6	27.0	25.4	0.06
930406	1600	3.17	0.093	0.093	10.72	10.72	0.0	-2.0	0.0	26.5	24.9	23.5	0.08
930406	1900	3.32	0.093	0.093	10.72	10.72	-2.0	-4.0	5.5	25.9	23.0	18.7	0.08
930406	2200	2.84	0.093	0.093	10.72	10.72	4.0	2.0	1.9	25.0	22.8	21.7	0.08
930407	0100	2.56	0.083	0.093	11.98	10.72	-14.0	-10.0	-2.1	23.7	20.7	22.5	0.08
930407	0400	2.43	0.093	0.093	10.72	10.72	2.0	-8.0	-3.2	21.7	19.3	16.9	0.08
930407	0700	2.28	0.083	0.093	11.98	10.72	-12.0	-12.0	2.8	24.1	19.2	18.8	0.10
930407	1000	2.29	0.093	0.093	10.72	10.72	2.0	0.0	-0.8	20.4	18.4	20.1	0.09
930407	1300	2.40	0.093	0.093	10.72	10.72	-8.0	-8.0	-4.2	20.4	20.3	18.4	0.09
930407	1600	2.68	0.074	0.074	13.56	13.56	-10.0	-8.0	-3.0	20.1	18.4	14.7	0.09
930407	1900	3.11	0.074	0.074	13.56	13.56	-12.0	-12.0	-8.8	17.1	15.6	9.9	0.11
930407	2200	2.32	0.074	0.074	13.56	13.56	-8.0	-10.0	-4.8	18.4	17.0	12.9	0.10
930408	0100	2.39	0.064	0.074	15.63	13.56	-10.0	-10.0	-7.2	14.6	13.1	10.3	0.10
930408	0400	2.60	0.064	0.064	15.63	15.63	-12.0	-10.0	-8.5	14.0	12.9	6.9	0.10
930408	0700	2.58	0.064	0.064	15.63	15.63	-12.0	-12.0	-8.2	12.5	13.0	4.9	0.11
930408	1000	2.48	0.074	0.074	13.56	13.56	-12.0	-12.0	-10.3	12.9	13.7	8.3	0.11
930408	1300	2.18	0.074	0.074	13.56	13.56	-12.0	-12.0	-8.9	16.5	15.6	12.1	0.09
930408	1600	2.22	0.074	0.074	13.56	13.56	-14.0	-14.0	-8.3	17.7	16.4	10.8	0.09
930408	1900	2.27	0.074	0.074	13.56	13.56	-12.0	-12.0	-7.4	17.2	15.6	9.1	0.10
930408	2200	2.11	0.074	0.074	13.56	13.56	-14.0	-14.0	-9.9	19.6	17.3	13.2	0.10
930409	0100	1.80	0.074	0.074	13.56	13.56	-14.0	-14.0	-8.5	18.3	16.0	10.2	0.10
930409	0400	1.71	0.083	0.083	11.98	11.98	-10.0	-12.0	-8.4	18.8	18.5	17.2	0.09
930409	0700	1.67	0.083	0.083	11.98	11.98	-12.0	-12.0	-8.1	19.0	18.5	19.3	0.12
930409	1000	1.63	0.083	0.083	11.98	11.98	-10.0	-10.0	-12.5	17.4	16.9	9.7	0.11
930409	1300	1.38	0.083	0.083	11.98	11.98	-12.0	-14.0	-11.9	18.3	18.4	14.5	0.11
930409	1600	1.34	0.083	0.083	11.98	11.98	-10.0	-10.0	-7.7	20.0	20.4	18.3	0.11
930409	1900	1.26	0.093	0.093	10.72	10.72	-10.0	-10.0	-7.8	23.9	24.6	19.8	0.15
930409	2200	1.21	0.083	0.093	11.98	10.72	-4.0	-6.0	-6.5	22.7	22.6	23.1	0.18
930410	0100	1.08	0.093	0.093	10.72	10.72	-16.0	-14.0	-11.4	23.3	23.2	21.1	0.13
930410	0400	1.06	0.093	0.093	10.72	10.72	-12.0	-12.0	-8.6	22.2	22.0	18.3	0.12
930410	0700	1.01	0.093	0.093	10.72	10.72	-16.0	-16.0	-16.4	23.9	24.6	22.6	0.13
930410	1000	1.13	0.132	0.093	7.56	10.72	-36.0	-38.0	-26.9	31.0	22.0	24.0	0.14

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{s,0}$ Hz	$f_{s,1}$ Hz	$T_{s,0}$ sec	$T_{s,1}$ sec	$\theta_{s,0}$ deg	$\theta_{s,1}$ deg	$\theta_{s,2}$ deg	$\Delta\theta_{s,0}$ deg	$\Delta\theta_{s,1}$ deg	$\Delta\theta_{s,2}$ deg	$x$
930410	1300	1.05	0.103	0.103	9.71	9.71	-4.0	-24.0	-21.2	28.6	24.5	20.7	0.13
930410	1600	1.07	0.123	0.103	8.16	9.71	-10.0	-12.0	-17.6	25.1	24.1	23.2	0.11
930410	1900	0.99	0.103	0.103	9.71	9.71	-2.0	-8.0	-14.9	26.5	26.0	21.4	0.14
930410	2200	0.92	0.103	0.103	9.71	9.71	-12.0	-4.0	-15.6	25.2	25.7	17.3	0.17
930411	0100	0.80	0.103	0.103	9.71	9.71	-10.0	-10.0	-17.9	24.5	25.5	19.1	0.18
930411	0400	0.72	0.103	0.103	9.71	9.71	-20.0	-8.0	-19.0	24.1	25.9	21.0	0.15
930411	0700	0.62	0.103	0.103	9.71	9.71	-4.0	-14.0	-11.7	27.4	28.9	25.5	0.22
930411	1000	0.59	0.113	0.103	8.87	9.71	2.0	2.0	-7.4	27.7	29.7	27.1	0.22
930411	1300	0.55	0.103	0.103	9.71	9.71	-6.0	-2.0	-3.7	25.7	27.7	21.9	0.29
930411	1600	0.53	0.064	0.103	15.63	9.71	-6.0	-4.0	1.5	27.5	29.1	32.5	0.24
930411	1900	0.53	0.103	0.103	9.71	9.71	12.0	12.0	3.7	28.4	28.4	26.7	0.25
930411	2200	0.50	0.064	0.064	15.63	15.63	-12.0	2.0	-2.2	28.6	29.9	20.4	0.22
930412	0100	0.48	0.064	0.064	15.63	15.63	-10.0	-8.0	-1.2	27.4	26.8	17.6	0.26
930412	0400	0.50	0.064	0.064	15.63	15.63	-14.0	0.0	-1.5	28.6	28.3	22.9	0.31
930412	0700	0.57	0.093	0.093	10.72	10.72	6.0	2.0	-2.5	24.8	24.1	18.0	0.30
930412	1000	0.59	0.064	0.093	15.63	10.72	-16.0	-10.0	-4.4	27.6	26.1	22.4	0.23
930412	1300	0.60	0.093	0.093	10.72	10.72	4.0	0.0	-4.9	28.2	27.5	24.5	0.25
930412	1600	0.66	0.083	0.083	11.98	11.98	-6.0	-4.0	-5.8	24.8	24.7	23.1	0.23
930412	1900	0.74	0.083	0.083	11.98	11.98	8.0	-8.0	-0.6	23.9	23.2	24.3	0.19
930412	2200	0.76	0.083	0.083	11.98	11.98	-8.0	-8.0	-4.6	24.8	23.8	27.6	0.23
930413	0100	0.76	0.074	0.083	13.56	11.98	-6.0	-8.0	-3.8	26.1	25.6	29.7	0.23
930413	0400	0.78	0.074	0.074	13.56	13.56	-8.0	-8.0	-4.8	24.1	22.2	16.9	0.20
930413	0700	0.82	0.074	0.074	13.56	13.56	-8.0	-10.0	-7.2	24.7	22.6	19.2	0.18
930413	1000	0.77	0.074	0.074	13.56	13.56	-18.0	2.0	-6.8	25.2	23.7	23.6	0.21
930413	1300	0.74	0.074	0.074	13.56	13.56	-4.0	-2.0	-3.9	27.3	24.3	22.8	0.19
930413	1600	0.71	0.074	0.074	13.56	13.56	-4.0	4.0	-5.1	26.5	23.6	24.0	0.22
930413	1900	0.75	0.074	0.074	13.56	13.56	2.0	6.0	3.8	27.3	22.3	23.4	0.19
930413	2200	0.81	0.074	0.074	13.56	13.56	2.0	4.0	0.2	23.8	21.2	19.5	0.22
930414	0100	0.87	0.074	0.074	13.56	13.56	2.0	4.0	-3.0	25.7	24.6	21.6	0.21
930414	0400	0.89	0.074	0.074	13.56	13.56	-10.0	-10.0	-4.2	26.1	25.2	25.7	0.20
930414	0700	0.93	0.074	0.074	13.56	13.56	-10.0	10.0	-4.5	23.6	20.8	21.4	0.15
930414	1000	0.97	0.074	0.074	13.56	13.56	0.0	0.0	0.1	22.3	20.1	15.3	0.15
930414	1300	1.04	0.093	0.083	10.72	11.98	-16.0	6.0	-7.9	24.0	20.1	21.8	0.16
930414	1600	1.03	0.093	0.083	10.72	11.98	-18.0	0.0	-9.9	24.0	21.8	25.0	0.14
930414	1900	1.07	0.083	0.093	11.98	10.72	-18.0	0.0	-7.6	23.8	21.7	24.7	0.14
930414	2200	1.05	0.083	0.083	11.98	11.98	-16.0	-14.0	-4.9	24.1	22.2	19.8	0.14
930415	0100	0.98	0.093	0.083	10.72	11.98	-16.0	-18.0	-12.2	25.2	24.0	20.9	0.17
930415	0400	0.98	0.083	0.083	11.98	11.98	-12.0	-12.0	-8.7	25.0	23.1	20.3	0.17
930415	0700	0.94	0.093	0.093	10.72	10.72	-16.0	-16.0	-9.5	21.9	21.2	18.4	0.14
930415	1000	0.90	0.083	0.083	11.98	11.98	-16.0	-14.0	-8.3	22.9	21.0	16.2	0.13
930415	1300	0.87	0.093	0.093	10.72	10.72	-16.0	-16.0	-8.1	24.2	23.4	22.1	0.15
930415	1600	0.80	0.093	0.093	10.72	10.72	-18.0	-16.0	-9.1	23.3	22.0	21.6	0.17
930415	1900	0.77	0.093	0.093	10.72	10.72	-12.0	-12.0	-6.3	22.6	19.8	15.7	0.14
930415	2200	0.69	0.093	0.103	10.72	9.71	-14.0	-14.0	-10.1	23.2	22.3	21.1	0.15
930416	0100	0.66	0.103	0.103	9.71	9.71	-14.0	-16.0	-13.1	23.8	23.8	20.6	0.14
930416	0400	0.68	0.142	0.103	7.04	9.71	-42.0	-16.0	-20.1	30.6	26.9	22.8	0.15
930416	0700	0.91	0.132	0.123	7.56	8.16	-40.0	-40.0	-34.0	23.6	17.4	11.9	0.13
930416	1000	1.08	0.103	0.113	9.71	8.87	-34.0	-36.0	-36.2	19.5	17.5	16.7	0.12
930416	1300	1.16	0.103	0.103	9.71	9.71	-36.0	-36.0	-37.5	17.7	17.4	10.5	0.14
930416	1600	0.99	0.103	0.103	9.71	9.71	-36.0	-36.0	-36.3	19.6	19.4	15.7	0.14
930416	1900	0.92	0.103	0.103	9.71	9.71	-36.0	-36.0	-35.2	21.3	20.1	17.7	0.13
930416	2200	0.87	0.103	0.103	9.71	9.71	-34.0	-34.0	-34.5	21.9	22.1	19.9	0.14
930417	0100	0.94	0.103	0.103	9.71	9.71	-34.0	-36.0	-36.9	21.7	22.2	23.3	0.15
930417	0400	0.87	0.103	0.103	9.71	9.71	-36.0	-36.0	-36.6	25.9	24.5	25.1	0.16
930417	0700	0.82	0.103	0.103	9.71	9.71	-34.0	-34.0	-28.3	26.1	24.7	24.2	0.15
930417	1000	0.75	0.113	0.103	8.87	9.71	-20.0	-38.0	-23.3	30.2	27.3	30.3	0.14
930417	1300	0.68	0.123	0.103	8.16	9.71	-40.0	-38.0	-24.3	32.2	27.7	32.4	0.16
930417	1600	0.64	0.113	0.103	8.87	9.71	-26.0	-24.0	-18.0	31.5	27.3	28.8	0.18

(Sheet 31 of 47)

Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{A/B}$ Hz	$f_{A/C}$ Hz	$T_{A/B}$ sec	$T_{A/C}$ sec	$\theta_{A/B}$ deg	$\theta_{A/C}$ deg	$\theta_{A/D}$ deg	$\Delta\theta_{AB}$ deg	$\Delta\theta_{AC}$ deg	$\Delta\theta_{AD}$ deg	$\chi$
930417	1900	0.64	0.103	0.113	9.71	8.87	2.0	-14.0	-19.5	31.4	27.0	29.5	0.18
930417	2200	0.64	0.123	0.103	8.16	9.71	-26.0	-26.0	-19.0	30.2	25.2	23.8	0.14
930418	0100	0.55	0.103	0.103	9.71	9.71	-8.0	-8.0	-16.6	30.7	26.5	21.3	0.18
930418	0400	0.50	0.123	0.123	8.16	8.16	-28.0	-28.0	-24.7	34.7	26.7	20.5	0.22
930418	0700	0.44	0.113	0.132	8.87	7.56	-4.0	-28.0	-18.2	32.2	25.3	20.2	0.23
930418	1000	0.42	0.132	0.132	7.56	7.56	-24.0	-16.0	-17.2	29.0	23.9	18.4	0.19
930418	1300	0.40	0.103	0.103	9.71	9.71	-12.0	-10.0	-16.0	26.6	24.8	19.2	0.23
930418	1600	0.39	0.142	0.113	7.04	8.87	-28.0	-22.0	-17.1	27.3	24.5	25.7	0.19
930418	1900	0.36	0.123	0.103	8.16	9.71	-28.0	-10.0	-19.7	28.3	25.0	20.6	0.23
930418	2200	0.36	0.103	0.103	9.71	9.71	-8.0	-8.0	-16.1	26.3	25.1	24.6	0.18
930419	0100	0.37	0.113	0.113	8.87	8.87	-12.0	-14.0	-16.9	26.6	25.7	26.2	0.17
930419	0400	0.39	0.142	0.142	7.04	7.04	-32.0	-30.0	-19.0	25.6	22.6	14.2	0.19
930419	0700	0.37	0.142	0.142	7.04	7.04	-32.0	-30.0	-25.3	26.8	25.3	16.5	0.20
930419	1000	0.34	0.132	0.132	7.56	7.56	-28.0	-30.0	-20.7	26.2	25.6	22.9	0.19
930419	1300	0.33	0.142	0.142	7.04	7.04	-30.0	-30.0	-21.4	27.7	25.2	16.9	0.17
930419	1600	0.35	0.142	0.142	7.04	7.04	-30.0	-30.0	-23.0	24.2	22.7	14.7	0.17
930419	1900	0.36	0.132	0.113	7.56	8.87	-28.0	-26.0	-21.4	27.0	24.7	28.5	0.19
930419	2200	0.39	0.123	0.123	8.16	8.16	-36.0	-24.0	-27.0	24.8	23.0	20.7	0.18
930420	0100	0.41	0.113	0.123	8.87	8.16	-14.0	-16.0	-21.2	23.1	22.6	21.7	0.18
930420	0400	0.39	0.123	0.123	8.16	8.16	-28.0	-10.0	-18.2	22.5	22.7	19.2	0.21
930420	0700	0.39	0.123	0.123	8.16	8.16	-26.0	-12.0	-22.2	25.7	24.0	20.1	0.20
930420	1000	0.40	0.123	0.123	8.16	8.16	-32.0	-10.0	-19.8	25.0	22.2	21.0	0.21
930420	1300	0.41	0.142	0.132	7.04	7.56	-30.0	-10.0	-20.3	23.9	22.3	23.0	0.25
930420	1600	0.39	0.064	0.064	15.63	15.63	-14.0	-14.0	-20.8	23.8	22.7	13.6	0.25
930420	1900	0.41	0.064	0.074	15.63	13.56	-10.0	-10.0	-15.2	22.5	21.4	20.8	0.26
930420	2200	0.45	0.074	0.074	13.56	13.56	-10.0	-12.0	-15.5	19.1	18.7	13.7	0.26
930421	0100	0.45	0.074	0.074	13.56	13.56	-10.0	-10.0	-11.7	17.5	17.7	13.3	0.19
930421	0400	0.44	0.074	0.074	13.56	13.56	-10.0	-12.0	-11.2	19.2	19.6	16.3	0.29
930421	0700	0.45	0.074	0.074	13.56	13.56	-8.0	-10.0	-10.0	19.2	19.9	15.7	0.30
930421	1000	0.48	0.074	0.074	13.56	13.56	-10.0	-12.0	-14.1	21.1	20.9	20.3	0.24
930421	1300	0.50	0.074	0.074	13.56	13.56	-6.0	-10.0	-11.1	19.7	18.8	16.5	0.21
930421	1600	0.50	0.074	0.074	13.56	13.56	-8.0	-10.0	-15.8	25.6	23.1	20.0	0.26
930421	1900	0.56	0.074	0.074	13.56	13.56	-12.0	-12.0	-20.2	24.1	19.8	18.7	0.21
930421	2200	0.60	0.074	0.074	13.56	13.56	-12.0	-16.0	-20.0	22.4	20.0	17.3	0.23
930422	0100	0.62	0.083	0.113	11.98	8.87	-16.0	-14.0	-12.3	21.2	22.1	24.0	0.17
930422	0400	0.68	0.113	0.113	8.87	8.87	-32.0	-14.0	-20.1	22.6	22.4	19.5	0.20
930422	0700	0.68	0.113	0.113	8.87	8.87	-26.0	-18.0	-20.7	27.2	26.2	22.5	0.21
930422	1000	0.66	0.113	0.113	8.87	8.87	-32.0	-18.0	-16.2	26.8	26.9	26.9	0.19
930422	1300	0.58	0.103	0.103	9.71	9.71	-18.0	-18.0	-13.8	24.4	22.3	10.7	0.16
930422	1600	0.57	0.113	0.113	8.87	8.87	-18.0	-18.0	-12.2	23.1	22.8	13.8	0.20
930422	1900	0.52	0.113	0.113	8.87	8.87	-18.0	-18.0	-15.5	27.3	28.1	18.3	0.24
930422	2200	0.44	0.113	0.113	8.87	8.87	-16.0	-14.0	-20.3	31.8	32.3	28.1	0.30
930423	0100	0.40	0.103	0.103	9.71	9.71	-16.0	-16.0	-21.9	29.4	29.5	19.1	0.26
930423	0400	0.37	0.103	0.103	9.71	9.71	-10.0	-10.0	-10.3	31.8	33.9	23.9	0.31
930423	0700	0.32	0.064	0.064	15.63	15.63	-16.0	-14.0	-2.4	32.6	27.6	15.0	0.34
930423	1000	0.28	0.064	0.064	15.63	15.63	-10.0	-10.0	-4.6	31.4	29.6	20.1	0.40
930423	1300	0.26	0.064	0.064	15.63	15.63	-12.0	-12.0	-14.3	29.2	28.9	21.8	0.34
930423	1600	0.28	0.064	0.064	15.63	15.63	-12.0	-12.0	-17.4	23.6	24.1	15.3	0.43
930423	1900	0.27	0.064	0.064	15.63	15.63	-12.0	-12.0	-19.2	26.2	26.3	19.0	0.49
930423	2200	0.26	0.064	0.064	15.63	15.63	-18.0	-18.0	-23.0	31.3	32.0	19.9	0.37
930424	0100	0.27	0.064	0.064	15.63	15.63	-24.0	-24.0	-8.5	41.0	27.3	22.6	0.34
930424	0400	0.26	0.064	0.064	15.63	15.63	-18.0	-20.0	-15.2	32.4	29.4	23.5	0.32
930424	0700	0.26	0.064	0.064	15.63	15.63	-16.0	-20.0	-17.5	28.9	28.8	23.7	0.28
930424	1000	0.29	0.064	0.064	15.63	15.63	-28.0	-28.0	-22.4	27.6	27.0	23.7	0.31
930424	1300	0.30	0.064	0.064	15.63	15.63	-20.0	-24.0	-21.0	26.1	25.4	21.2	0.33
930424	1600	0.31	0.064	0.064	15.63	15.63	-20.0	-18.0	-17.5	24.3	23.9	19.2	0.30
930424	1900	0.31	0.064	0.064	15.63	15.63	-20.0	-24.0	-23.3	21.9	22.9	16.2	0.28
930424	2200	0.32	0.064	0.064	15.63	15.63	-24.0	-24.0	-20.1	24.8	23.7	20.6	0.31

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{a,ms}$ Hz	$T_{s,ms}$ sec	$T_{a,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{a,ms}$ deg	$\theta_{s,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$x$
930425	0100	0.32	0.074	0.074	13.56	13.56	-20.0	-22.0	-20.7	24.1	22.9	16.6	0.34
930425	0400	0.34	0.074	0.074	13.56	13.56	-18.0	-20.0	-20.0	24.1	22.8	18.1	0.26
930425	0700	0.34	0.074	0.074	13.56	13.56	-26.0	-22.0	-23.7	25.4	21.6	20.7	0.25
930425	1000	0.33	0.074	0.074	13.56	13.56	-26.0	-26.0	-25.0	25.2	21.6	17.6	0.25
930425	1300	0.33	0.064	0.074	15.63	13.56	-20.0	-18.0	-20.0	24.0	22.4	23.3	0.33
930425	1600	0.31	0.074	0.074	13.56	13.56	-14.0	-14.0	-17.3	24.0	21.9	20.4	0.23
930425	1900	0.29	0.074	0.074	13.56	13.56	-28.0	-36.0	-25.5	27.4	23.0	22.3	0.23
930425	2200	0.31	0.142	0.074	7.04	13.56	-40.0	-38.0	-28.0	27.4	19.7	22.0	0.21
930426	0100	0.33	0.142	0.074	7.04	13.56	-38.0	-36.0	-30.1	25.2	18.5	25.2	0.26
930426	0400	0.32	0.142	0.074	7.04	13.56	-38.0	-38.0	-30.5	24.7	18.5	21.9	0.24
930426	0700	0.32	0.142	0.074	7.04	13.56	-40.0	-38.0	-29.1	26.0	19.2	20.7	0.22
930426	1000	0.31	0.142	0.074	7.04	13.56	-42.0	-40.0	-30.2	26.1	19.9	21.9	0.24
930426	1300	0.32	0.142	0.074	7.04	13.56	-38.0	-28.0	-27.7	24.8	21.0	24.4	0.21
930426	1600	0.37	0.142	0.142	7.04	7.04	-40.0	-38.0	-32.1	19.6	15.9	11.1	0.19
930426	1900	0.42	0.142	0.142	7.04	7.04	-42.0	-40.0	-34.6	17.7	13.1	8.5	0.18
930426	2200	0.45	0.142	0.142	7.04	7.04	-46.0	-44.0	-38.1	17.2	12.0	8.2	0.17
930427	0100	0.41	0.132	0.132	7.56	7.56	-44.0	-42.0	-34.4	28.0	29.6	14.9	0.18
930427	0400	0.41	0.142	0.142	7.04	7.04	28.0	-32.0	-11.9	55.8	30.2	26.5	0.19
930427	0700	1.08	0.142	0.142	7.04	7.04	20.0	18.0	16.6	16.5	15.8	14.3	0.11
930427	1000	1.39	0.123	0.123	8.16	8.16	12.0	12.0	11.6	16.9	17.0	11.7	0.10
930427	1300	1.52	0.123	0.123	8.16	8.16	18.0	18.0	10.2	19.5	18.1	15.9	0.09
930427	1600	1.53	0.132	0.142	7.56	7.04	18.0	18.0	15.0	20.6	19.3	16.4	0.09
930427	1900	1.48	0.093	0.093	10.72	10.72	8.0	8.0	9.0	19.0	17.9	16.8	0.11
930427	2200	1.43	0.093	0.093	10.72	10.72	8.0	14.0	12.0	17.9	16.8	17.0	0.13
930428	0100	1.52	0.093	0.093	10.72	10.72	10.0	10.0	10.0	14.9	14.6	13.5	0.13
930428	0400	1.57	0.093	0.083	10.72	11.98	12.0	8.0	7.7	16.7	16.6	18.1	0.12
930428	0700	1.77	0.093	0.083	10.72	11.98	8.0	8.0	6.5	15.5	15.6	14.7	0.10
930428	1000	1.73	0.083	0.083	11.98	11.98	0.0	0.0	4.3	14.8	14.6	14.0	0.12
930428	1300	1.59	0.083	0.093	11.98	10.72	6.0	6.0	4.4	15.0	15.1	15.5	0.12
930428	1600	1.66	0.093	0.093	10.72	10.72	8.0	8.0	6.7	15.6	15.6	14.1	0.12
930428	1900	1.88	0.083	0.083	11.98	11.98	-8.0	6.0	-0.9	18.2	17.2	16.2	0.11
930428	2200	2.09	0.093	0.093	10.72	10.72	6.0	4.0	2.0	15.3	16.4	12.8	0.11
930429	0100	1.96	0.093	0.093	10.72	10.72	2.0	2.0	1.7	16.9	15.9	12.5	0.12
930429	0400	1.81	0.083	0.083	11.98	11.98	2.0	2.0	1.6	16.9	17.1	13.6	0.12
930429	0700	1.97	0.083	0.083	11.98	11.98	-2.0	-2.0	-1.5	16.3	16.0	11.6	0.10
930429	1000	2.00	0.083	0.083	11.98	11.98	-2.0	0.0	0.1	17.0	16.7	15.4	0.12
930429	1300	1.91	0.093	0.093	10.72	10.72	-2.0	0.0	-1.1	17.2	17.1	15.5	0.12
930429	1600	1.82	0.093	0.093	10.72	10.72	8.0	0.0	-1.3	20.7	19.9	19.9	0.12
930429	1900	1.98	0.093	0.093	10.72	10.72	4.0	2.0	-0.7	17.6	16.3	13.2	0.10
930429	2200	2.02	0.083	0.093	11.98	10.72	-10.0	0.0	-5.6	20.3	18.2	18.0	0.11
930430	0100	2.00	0.093	0.083	10.72	11.98	2.0	2.0	-5.8	19.4	18.0	18.6	0.11
930430	0400	1.95	0.083	0.083	11.98	11.98	-14.0	-12.0	-8.6	19.2	17.5	14.9	0.11
930430	0700	1.79	0.083	0.083	11.98	11.98	-10.0	-10.0	-6.7	20.8	19.4	18.7	0.10
930430	1000	1.54	0.093	0.093	10.72	10.72	-2.0	0.0	-1.4	21.2	20.4	18.1	0.11
930430	1300	1.36	0.093	0.093	10.72	10.72	4.0	2.0	2.3	19.6	19.8	18.0	0.14
930430	1600	1.31	0.093	0.093	10.72	10.72	-4.0	-6.0	-3.3	19.5	19.4	18.0	0.13
930430	1900	1.24	0.093	0.093	10.72	10.72	-10.0	-10.0	-4.6	21.2	20.2	17.9	0.12
930430	2200	1.54	0.093	0.093	10.72	10.72	-6.0	0.0	-3.0	18.6	18.3	18.0	0.12
930501	0100	1.49	0.093	0.093	10.72	10.72	6.0	2.0	2.1	19.6	19.6	19.2	0.14
930501	0400	1.30	0.083	0.093	11.98	10.72	-14.0	2.0	-1.9	21.9	20.7	21.3	0.15
930501	0700	1.17	0.103	0.103	9.71	9.71	6.0	6.0	-1.5	23.3	23.0	24.5	0.12
930501	1000	1.16	0.103	0.103	9.71	9.71	6.0	6.0	2.2	26.2	26.3	28.2	0.13
930501	1300	1.17	0.093	0.103	10.72	9.71	-10.0	-2.0	-3.0	27.0	26.8	30.2	0.17
930501	1600	1.00	0.093	0.103	10.72	9.71	-10.0	10.0	3.2	31.1	29.9	29.2	0.18
930501	1900	0.94	0.103	0.103	9.71	9.71	2.0	2.0	2.5	31.4	31.5	29.6	0.14
930501	2200	0.95	0.103	0.103	9.71	9.71	-28.0	0.0	-11.1	30.8	30.1	30.1	0.12
930502	0100	0.88	0.103	0.103	9.71	9.71	-6.0	0.0	-10.1	31.3	30.6	25.3	0.17
930502	0400	0.80	0.113	0.103	8.87	9.71	-26.0	4.0	-4.3	30.8	29.3	26.4	0.19

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Table A1 (Continued)

Date	Time EST	H <sub>m</sub> m	f <sub>h</sub> Hz	f <sub>h</sub> Hz	T <sub>h</sub> sec	T <sub>h</sub> sec	θ <sub>h</sub> deg	θ <sub>h</sub> deg	θ <sub>h</sub> deg	Δθ <sub>h</sub> deg	Δθ <sub>h</sub> deg	Δθ <sub>h</sub> deg	X
930502	0700	0.78	0.103	0.103	9.71	9.71	-2.0	-2.0	-4.4	24.6	24.1	21.2	0.14
930502	1000	0.77	0.103	0.103	9.71	9.71	-8.0	2.0	-6.9	26.0	26.0	23.9	0.12
930502	1300	0.78	0.103	0.113	9.71	8.87	-16.0	2.0	-4.8	23.9	23.2	22.7	0.18
930502	1600	0.71	0.103	0.103	9.71	9.71	-16.0	-14.0	-8.5	25.6	25.5	24.5	0.19
930502	1900	0.63	0.113	0.103	8.87	9.71	-20.0	-16.0	-10.2	26.9	26.4	23.4	0.20
930502	2200	0.64	0.103	0.113	9.71	8.87	-10.0	-12.0	-12.6	23.5	23.3	21.4	0.13
930503	0100	0.63	0.103	0.103	9.71	9.71	-10.0	-10.0	-10.8	24.3	23.5	20.7	0.18
930503	0400	0.60	0.113	0.113	8.87	8.87	-14.0	-14.0	-14.8	27.4	26.3	28.3	0.18
930503	0700	0.59	0.113	0.113	8.87	8.87	-4.0	-6.0	-9.7	27.8	26.6	25.3	0.20
930503	1000	0.57	0.113	0.113	8.87	8.87	2.0	2.0	-2.2	24.2	24.8	22.3	0.14
930503	1300	0.57	0.113	0.113	8.87	8.87	-18.0	2.0	-6.4	24.3	25.1	22.6	0.16
930503	1600	0.57	0.103	0.113	9.71	8.87	-16.0	-16.0	-8.9	27.0	28.0	23.3	0.17
930503	1900	0.56	0.103	0.103	9.71	9.71	0.0	-18.0	-8.3	26.4	25.7	24.9	0.20
930503	2200	0.58	0.142	0.103	7.04	9.71	-18.0	-10.0	-11.1	25.1	23.9	23.5	0.14
930504	0100	0.61	0.123	0.113	8.16	8.87	-30.0	-8.0	-18.5	26.9	26.6	24.1	0.16
930504	0400	0.64	0.103	0.113	9.71	8.87	-8.0	-8.0	-17.4	28.4	25.5	25.9	0.18
930504	0700	0.62	0.113	0.113	8.87	8.87	-8.0	-8.0	-10.9	28.4	27.5	24.1	0.18
930504	1000	0.62	0.113	0.113	8.87	8.87	-18.0	-14.0	-14.3	25.0	25.5	21.6	0.13
930504	1300	0.65	0.123	0.113	8.16	8.87	-8.0	-6.0	-6.7	25.8	26.3	25.2	0.15
930504	1600	0.69	0.113	0.113	8.87	8.87	-12.0	-14.0	-7.9	28.8	27.8	27.3	0.22
930504	1900	0.69	0.103	0.103	9.71	9.71	4.0	6.0	-7.2	32.3	30.4	30.9	0.19
930504	2200	0.75	0.103	0.103	9.71	9.71	-8.0	-2.0	-13.4	26.0	25.9	20.7	0.12
930505	0100	0.80	0.103	0.103	9.71	9.71	-16.0	-16.0	-13.4	27.0	27.7	24.5	0.12
930505	0400	0.80	0.103	0.103	9.71	9.71	-12.0	-10.0	-10.1	25.9	26.3	23.9	0.18
930505	0700	0.76	0.103	0.103	9.71	9.71	-12.0	0.0	-8.9	27.8	27.2	23.4	0.21
930505	1000	0.67	0.113	0.103	8.87	9.71	6.0	4.0	-6.0	29.6	29.4	28.0	0.13
930505	1300	0.66	0.113	0.113	8.87	8.87	-18.0	-16.0	-15.3	25.9	26.6	26.4	0.13
930505	1600	0.67	0.103	0.113	9.71	8.87	-12.0	-12.0	-16.1	27.7	27.4	24.3	0.19
930505	1900	0.61	0.113	0.113	8.87	8.87	-14.0	-12.0	-2.5	28.8	29.6	25.6	0.18
930505	2200	0.61	0.103	0.103	9.71	9.71	-12.0	-12.0	-10.0	26.3	25.6	15.9	0.17
930506	0100	0.58	0.113	0.113	8.87	8.87	-4.0	-8.0	-8.7	26.9	27.1	25.2	0.14
930506	0400	0.58	0.123	0.113	8.16	8.87	-30.0	0.0	-18.7	29.2	28.0	29.8	0.17
930506	0700	0.57	0.113	0.103	8.87	9.71	-20.0	-20.0	-24.1	30.6	29.8	30.6	0.20
930506	1300	0.49	0.103	0.113	9.71	8.87	-22.0	-20.0	-16.3	26.5	26.4	24.5	0.15
930506	1600	0.50	0.113	0.113	8.87	8.87	-20.0	-14.0	-13.7	28.4	28.6	29.8	0.19
930506	1900	0.47	0.113	0.113	8.87	8.87	-14.0	-12.0	-14.3	28.2	28.3	25.9	0.18
930506	2200	0.44	0.103	0.113	9.71	8.87	-28.0	-20.0	-14.2	29.0	29.4	25.7	0.22
930507	0100	0.43	0.113	0.113	8.87	8.87	-26.0	-26.0	-21.8	27.2	26.8	25.5	0.16
930507	0400	0.39	0.123	0.113	8.16	8.87	10.0	-24.0	-16.9	31.1	30.2	30.6	0.20
930507	0700	0.36	0.113	0.113	8.87	8.87	-24.0	-22.0	-21.0	30.5	29.6	33.9	0.18
930507	1000	0.35	0.113	0.113	8.87	8.87	2.0	-12.0	-14.1	27.2	27.2	26.4	0.28
930507	1300	0.35	0.113	0.113	8.87	8.87	-24.0	-6.0	-14.0	26.7	26.2	24.5	0.26
930507	1600	0.34	0.123	0.123	8.16	8.16	-32.0	-22.0	-23.3	28.3	26.9	28.0	0.27
930507	1900	0.34	0.123	0.123	8.16	8.16	-16.0	-16.0	-19.9	28.0	26.3	22.0	0.21
930507	2200	0.37	0.132	0.123	7.56	8.16	-40.0	-12.0	-22.0	27.9	25.3	20.2	0.20
930508	0100	0.37	0.132	0.132	7.56	7.56	-38.0	-12.0	-21.3	27.3	23.8	25.4	0.23
930508	0400	0.39	0.123	0.123	8.16	8.16	-20.0	-18.0	-21.2	27.7	24.4	20.5	0.20
930508	0700	0.40	0.132	0.132	7.56	7.56	-10.0	-12.0	-20.9	27.9	27.0	23.4	0.19
930508	1000	0.41	0.132	0.132	7.56	7.56	-44.0	-12.0	-27.8	29.8	25.8	26.2	0.21
930508	1300	0.41	0.132	0.132	7.56	7.56	-38.0	-38.0	-26.8	28.1	22.3	22.6	0.20
930508	1600	0.43	0.132	0.132	7.56	7.56	-26.0	-28.0	-24.4	24.5	21.5	21.3	0.21
930508	1900	0.45	0.123	0.123	8.16	8.16	-30.0	-30.0	-26.8	26.0	21.9	14.7	0.18
930508	2200	0.47	0.142	0.132	7.04	7.56	-36.0	-32.0	-29.0	24.6	21.9	22.6	0.18
930509	0100	0.47	0.132	0.132	7.56	7.56	-30.0	-30.0	-26.3	23.3	22.4	21.5	0.18
930509	0400	0.49	0.142	0.132	7.04	7.56	-32.0	-30.0	-26.2	22.8	22.1	21.9	0.16
930509	0700	0.52	0.132	0.132	7.56	7.56	-20.0	-20.0	-18.4	23.5	23.8	22.2	0.17
930509	1000	0.60	0.123	0.123	8.16	8.16	-4.0	-6.0	-5.0	22.5	22.4	21.5	0.19
930509	1300	0.62	0.123	0.123	8.16	8.16	-4.0	-4.0	-6.1	23.6	23.5	17.5	0.16

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{A,0}$ Hz	$f_{A,10}$ Hz	$T_{A,0}$ sec	$T_{A,10}$ sec	$\theta_{A,0}$ deg	$\theta_{A,10}$ deg	$\theta_{A,20}$ deg	$\Delta\theta_{0-10}$ deg	$\Delta\theta_{10-20}$ deg	$\Delta\theta_{0-20}$ deg	$\chi$
930509	1600	0.59	0.123	0.123	8.16	8.16	-4.0	-4.0	-7.9	25.7	26.3	19.8	0.14
930509	1900	0.57	0.123	0.132	8.16	7.56	-32.0	-30.0	-20.3	28.8	27.8	26.3	0.15
930509	2200	0.56	0.113	0.113	8.87	8.87	-2.0	-28.0	-9.8	29.3	28.2	23.2	0.16
930510	0100	0.53	0.113	0.113	8.87	8.87	-20.0	-32.0	-14.1	28.9	25.3	21.1	0.18
930510	0400	0.54	0.113	0.123	8.87	8.16	-28.0	-30.0	-19.3	29.0	25.3	25.6	0.15
930510	0700	0.55	0.123	0.123	8.16	8.16	-18.0	-30.0	-16.1	27.3	24.8	23.0	0.16
930510	1000	0.54	0.113	0.113	8.87	8.87	-32.0	-32.0	-22.1	30.3	28.6	30.4	0.17
930510	1300	0.54	0.123	0.113	8.16	8.87	-30.0	-30.0	-29.7	26.5	26.9	28.6	0.16
930510	1600	0.57	0.103	0.113	9.71	8.87	-34.0	-24.0	-23.8	23.9	23.3	24.6	0.14
930510	1900	0.57	0.093	0.113	10.72	8.87	-32.0	-32.0	-21.7	25.5	24.7	22.3	0.17
930510	2200	0.62	0.103	0.103	9.71	9.71	-32.0	-32.0	-23.8	24.0	22.4	12.8	0.15
930511	0100	0.55	0.103	0.103	9.71	9.71	-32.0	-32.0	-27.8	24.2	23.5	21.1	0.20
930511	0400	0.55	0.103	0.103	9.71	9.71	-34.0	-34.0	-28.9	23.5	22.0	21.5	0.17
930511	0700	0.59	0.113	0.103	8.87	9.71	-22.0	-22.0	-24.2	23.8	23.0	22.0	0.17
930511	1300	0.59	0.093	0.103	10.72	9.71	-32.0	-34.0	-22.6	27.3	28.1	25.4	0.23
930511	1600	0.57	0.103	0.103	9.71	9.71	-34.0	-34.0	-30.4	32.2	26.4	20.6	0.23
930511	1900	0.54	0.103	0.103	9.71	9.71	-26.0	-32.0	-30.0	32.1	27.6	24.0	0.25
930511	2200	0.49	0.103	0.103	9.71	9.71	-32.0	-32.0	-26.9	31.3	28.8	23.9	0.26
930512	0100	0.48	0.113	0.103	8.87	9.71	-32.0	-12.0	-24.9	31.9	30.0	30.3	0.26
930512	0400	0.50	0.083	0.093	11.98	10.72	-14.0	-14.0	-21.4	31.0	29.5	24.4	0.28
930512	0700	0.55	0.083	0.093	11.98	10.72	-12.0	-14.0	-16.4	28.0	27.5	20.9	0.25
930512	1300	0.51	0.093	0.093	10.72	10.72	-16.0	-14.0	-25.2	33.9	26.1	23.9	0.23
930512	1600	0.49	0.093	0.093	10.72	10.72	-18.0	-14.0	-30.5	36.3	20.9	20.1	0.25
930512	1900	0.45	0.103	0.093	9.71	10.72	-18.0	-44.0	-30.2	39.0	21.9	27.2	0.25
930512	2200	0.42	0.142	0.093	7.04	10.72	-44.0	-52.0	-39.9	41.0	19.0	22.3	0.26
930513	0100	0.39	0.142	0.093	7.04	10.72	-46.0	-52.0	-41.6	43.6	22.0	25.8	0.22
930513	0400	0.35	0.103	0.093	9.71	10.72	-32.0	-32.0	-32.7	48.9	41.9	27.1	0.24
930513	0700	0.36	0.171	0.103	5.83	9.71	-48.0	-50.0	-38.2	45.8	30.9	36.0	0.25
930513	1000	0.41	0.171	0.103	5.83	9.71	-52.0	-52.0	-42.2	39.6	19.9	35.6	0.21
930513	1300	0.41	0.162	0.093	6.19	10.72	-52.0	-54.0	-45.7	41.5	19.9	36.4	0.19
930513	1600	0.36	0.142	0.093	7.04	10.72	-46.0	-58.0	-40.8	44.2	22.7	32.4	0.99
930513	1900	0.35	0.132	0.093	7.56	10.72	-42.0	-60.0	-36.9	47.8	22.0	34.2	0.30
930513	2200	0.34	0.152	0.093	6.59	10.72	-48.0	-54.0	-39.6	47.3	23.3	31.6	0.25
930514	0100	0.38	0.171	0.093	5.83	10.72	-54.0	-56.0	-44.7	46.7	24.1	32.8	0.19
930514	0400	0.37	0.142	0.093	7.04	10.72	-44.0	-44.0	-39.7	41.6	30.9	33.1	0.22
930514	0700	0.79	0.279	0.279	3.59	3.59	58.0	58.0	33.5	50.8	19.1	13.4	0.24
930514	1000	0.95	0.240	0.240	4.17	4.17	52.0	52.0	37.2	35.9	24.8	16.4	0.21
930514	1300	1.07	0.210	0.210	4.75	4.75	46.0	46.0	41.4	24.8	24.6	17.0	0.19
930514	1600	0.85	0.201	0.201	4.98	4.98	46.0	46.0	36.5	36.0	26.8	16.6	0.18
930514	1900	0.63	0.210	0.210	4.75	4.75	42.0	42.0	22.6	51.7	28.9	17.3	0.17
930514	2200	0.58	0.220	0.220	4.54	4.54	24.0	26.0	13.5	51.5	32.1	23.2	0.17
930515	0100	0.60	0.230	0.220	4.35	4.54	26.0	20.0	9.7	56.4	33.5	21.4	0.17
930515	0400	0.54	0.152	0.103	6.59	9.71	-50.0	16.0	4.6	50.1	34.2	35.9	0.21
930515	0700	0.51	0.162	0.103	6.19	9.71	-52.0	14.0	-3.7	51.4	36.4	42.4	0.22
930515	1000	0.53	0.152	0.103	6.59	9.71	-46.0	16.0	6.0	51.4	43.9	35.0	0.21
930515	1300	0.62	0.171	0.152	5.83	6.59	20.0	18.0	-13.2	63.1	38.8	59.5	0.24
930515	1600	0.65	0.142	0.279	7.04	13.56	-42.0	-72.0	-34.3	67.6	33.5	21.0	0.32
930515	1900	0.50	0.074	0.074	13.56	13.56	-12.0	-60.0	-26.4	54.2	33.5	31.9	0.26
930515	2200	0.46	0.142	0.074	7.04	13.56	-40.0	-38.0	-26.2	44.9	36.5	29.4	0.28
930516	0100	0.49	0.074	0.074	13.56	13.56	-8.0	-8.0	-19.3	40.5	36.2	26.0	0.23
930516	0400	0.50	0.074	0.074	13.56	13.56	-12.0	-8.0	-22.2	37.8	34.4	29.1	0.25
930516	0700	0.48	0.074	0.074	13.56	13.56	-12.0	-12.0	-15.9	36.1	33.7	24.6	0.26
930516	1000	0.48	0.083	0.083	11.98	11.98	-12.0	12.0	-14.2	40.5	36.1	31.0	0.24
930516	1300	0.51	0.083	0.083	11.98	11.98	-10.0	-10.0	-26.5	40.5	32.3	25.5	0.23
930516	1600	0.51	0.298	0.083	3.35	11.98	-54.0	-52.0	-23.6	43.8	26.8	26.2	0.26
930516	1900	0.45	0.083	0.083	11.98	11.98	-8.0	-10.0	-21.6	39.6	26.9	25.8	0.25
930516	2200	0.44	0.083	0.083	11.98	11.98	-10.0	-10.0	-16.6	34.8	28.2	26.8	0.25

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{s,0}$ Hz	$f_{s,1}$ Hz	$T_{s,0}$ sec	$T_{s,1}$ sec	$\theta_{s,0}$ deg	$\theta_{s,1}$ deg	$\theta_{s,2}$ deg	$\Delta\theta_{s,0}$ deg	$\Delta\theta_{s,1}$ deg	$\Delta\theta_{s,2}$ deg	$\lambda$
930517	0100	0.45	0.132	0.083	7.56	11.98	-8.0	-8.0	-12.6	33.9	30.8	32.9	0.24
930517	0400	0.46	0.083	0.083	11.98	11.98	-4.0	-4.0	-9.4	34.0	31.7	22.4	0.22
930517	0700	0.55	0.083	0.083	11.98	11.98	-6.0	-8.0	-9.1	49.8	28.6	25.2	0.21
930517	1000	0.53	0.083	0.083	11.98	11.98	0.0	-10.0	-15.5	43.1	37.0	26.9	0.22
930517	1300	0.48	0.093	0.083	10.72	11.98	14.0	10.0	-23.1	46.8	33.1	27.2	0.22
930517	1600	0.59	0.298	0.298	3.35	3.35	48.0	48.0	11.8	56.0	36.8	33.0	0.29
930517	1900	0.57	0.308	0.308	3.25	3.25	44.0	30.0	8.2	47.1	35.2	27.2	0.29
930517	2200	0.55	0.093	0.093	10.72	10.72	-16.0	36.0	9.0	46.9	35.3	24.4	0.26
930518	0100	0.52	0.093	0.093	10.72	10.72	-12.0	48.0	11.3	49.9	36.7	25.2	0.24
930518	0400	0.48	0.279	0.093	3.59	10.72	48.0	48.0	12.5	58.8	29.2	24.8	0.21
930518	0700	0.48	0.240	0.093	4.17	10.72	40.0	40.0	12.4	54.2	29.3	29.0	0.22
930518	1000	0.50	0.103	0.093	9.71	10.72	4.0	-90.0	-22.7	68.0	44.1	27.8	0.24
930518	1300	0.49	0.279	0.093	3.59	10.72	-62.0	-62.0	-39.9	60.0	32.3	25.4	0.21
930518	1600	0.49	0.230	0.093	4.35	10.72	-58.0	-62.0	-41.8	49.4	21.5	31.2	0.21
930518	1900	0.40	0.093	0.083	10.72	11.98	-14.0	-64.0	-34.9	53.6	29.9	33.3	0.23
930518	2200	0.43	0.152	0.093	6.59	10.72	-46.0	-46.0	-32.4	49.2	24.9	27.3	0.24
930519	0100	0.47	0.142	0.093	7.04	10.72	-42.0	-42.0	-36.6	50.5	25.4	29.1	0.24
930519	0400	0.54	0.142	0.093	7.04	10.72	-44.0	-44.0	-4.2	60.6	54.8	25.9	0.20
930519	0700	0.50	0.162	0.093	6.19	10.72	-48.0	-48.0	-29.4	47.3	40.0	30.0	0.21
930519	1000	0.47	0.152	0.093	6.59	10.72	-44.0	-46.0	-25.8	42.7	27.2	30.9	0.22
930519	1300	0.48	0.093	0.093	10.72	10.72	14.0	-50.0	-26.1	47.0	30.2	29.3	0.23
930519	1600	0.44	0.093	0.093	10.72	10.72	-4.0	-12.0	-24.7	46.8	35.5	27.9	0.27
930519	1900	0.45	0.093	0.093	10.72	10.72	14.0	-14.0	-25.2	50.1	35.1	32.8	0.26
930519	2200	0.46	0.132	0.093	7.56	10.72	-42.0	-14.0	-20.1	47.1	36.6	26.3	0.25
930520	0100	0.52	0.142	0.093	7.04	10.72	-44.0	-14.0	-29.0	46.6	39.2	29.6	0.24
930520	0400	0.54	0.152	0.093	6.59	10.72	-48.0	-46.0	-31.9	49.0	41.1	29.1	0.21
930520	0700	0.65	0.142	0.152	7.04	6.59	-44.0	-44.0	-37.5	43.5	28.9	15.8	0.20
930520	1000	0.76	0.083	0.250	11.98	4.01	-10.0	50.0	11.0	83.1	38.8	26.6	0.20
930520	1300	0.86	0.230	0.230	4.35	4.35	46.0	46.0	23.4	54.4	28.4	14.9	0.24
930520	1600	0.86	0.289	0.250	3.47	4.01	46.0	46.0	19.9	53.9	25.1	16.2	0.28
930520	1900	0.87	0.250	0.230	4.01	4.35	42.0	44.0	25.7	36.6	22.1	20.1	0.33
930520	2200	0.86	0.220	0.220	4.54	4.54	38.0	44.0	22.1	40.5	21.6	15.5	0.32
930521	0100	0.71	0.240	0.083	4.17	11.98	44.0	44.0	6.9	53.9	24.8	21.3	0.29
930521	0400	0.66	0.083	0.083	11.98	11.98	-10.0	42.0	6.5	48.5	30.0	24.0	0.31
930521	0700	0.63	0.064	0.083	15.63	11.98	-14.0	38.0	0.9	45.3	30.6	32.7	0.32
930521	1000	0.64	0.054	0.054	18.45	18.45	-12.0	36.0	6.7	41.8	27.6	21.6	0.33
930521	1300	0.73	0.064	0.064	15.63	15.63	-12.0	18.0	4.9	38.3	23.8	18.9	0.27
930521	1600	0.73	0.064	0.083	15.63	11.98	-14.0	14.0	6.6	36.5	26.0	21.8	0.22
930521	1900	0.64	0.064	0.064	15.63	15.63	-14.0	18.0	2.4	39.2	29.3	30.4	0.25
930521	2200	0.58	0.064	0.064	15.63	15.63	-14.0	-14.0	-7.2	37.0	32.4	27.3	0.26
930522	0100	0.55	0.064	0.064	15.63	15.63	-12.0	-14.0	-10.4	34.5	30.1	27.0	0.30
930522	0400	0.54	0.064	0.074	15.63	13.56	-16.0	-14.0	-8.7	35.3	29.6	27.6	0.30
930522	0700	0.53	0.064	0.074	15.63	13.56	-14.0	-16.0	-9.8	37.1	28.5	27.8	0.28
930522	1000	0.69	0.318	0.074	3.15	13.56	46.0	46.0	11.3	54.2	20.4	25.0	0.26
930522	1300	0.73	0.269	0.074	3.72	13.56	50.0	48.0	15.8	55.1	20.3	24.4	0.21
930522	1600	0.58	0.074	0.074	13.56	13.56	-12.0	-14.0	5.3	49.1	23.8	24.8	0.23
930522	1900	0.48	0.074	0.074	13.56	13.56	-12.0	-14.0	-2.3	33.2	26.9	29.9	0.28
930522	2200	0.45	0.074	0.074	13.56	13.56	-14.0	-12.0	1.4	36.2	25.6	30.7	0.32
930523	0100	0.46	0.074	0.074	13.56	13.56	-10.0	-10.0	1.5	36.1	22.7	24.1	0.34
930523	0400	0.46	0.074	0.074	13.56	13.56	-14.0	-12.0	-0.6	31.6	21.7	22.6	0.32
930523	0700	0.43	0.074	0.074	13.56	13.56	-12.0	-12.0	-2.6	30.9	22.8	26.0	0.31
930523	1000	0.39	0.064	0.064	15.63	15.63	-14.0	-10.0	-3.4	31.7	23.2	23.5	0.34
930523	1300	0.39	0.064	0.064	15.63	15.63	-12.0	-12.0	-1.6	27.4	24.7	26.0	0.40
930523	1600	0.40	0.064	0.064	15.63	15.63	-12.0	-10.0	-11.0	26.7	27.0	22.4	0.32
930523	1900	0.47	0.289	0.064	3.47	15.63	-90.0	-90.0	-37.3	69.6	28.4	24.5	0.41
930523	2200	0.40	0.064	0.074	15.63	13.56	-14.0	-12.0	-20.8	34.6	29.1	23.3	0.30
930524	0100	0.41	0.113	0.074	8.87	13.56	-6.0	-8.0	-14.6	26.5	25.6	27.2	0.31
930524	0400	0.41	0.123	0.074	8.16	13.56	-10.0	-8.0	-10.0	26.0	23.8	25.3	0.27

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{A,0}$ Hz	$f_{A,10}$ Hz	$T_{A,0}$ sec	$T_{A,10}$ sec	$\theta_{A,0}$ deg	$\theta_{A,10}$ deg	$\theta_{A,20}$ deg	$\Delta\theta_{0-10}$ deg	$\Delta\theta_{10-20}$ deg	$\Delta\theta_{0-20}$ deg	$\lambda$
930524	0700	0.42	0.074	0.074	13.56	13.56	-12.0	-12.0	-12.1	25.0	24.4	21.5	0.27
930524	1000	0.43	0.074	0.093	13.56	10.72	-12.0	-14.0	-14.1	28.1	27.0	25.9	0.26
930524	1300	0.47	0.103	0.103	9.71	9.71	-18.0	-18.0	-17.7	24.6	21.1	18.5	0.23
930524	1600	0.55	0.103	0.103	9.71	9.71	-18.0	-54.0	-27.0	35.8	15.6	17.0	0.27
930524	1900	0.50	0.103	0.103	9.71	9.71	-18.0	-14.0	-17.2	21.0	19.4	17.1	0.27
930524	2200	0.48	0.103	0.103	9.71	9.71	-18.0	-16.0	-17.1	20.6	20.7	19.0	0.24
930525	0100	0.50	0.103	0.103	9.71	9.71	-20.0	-18.0	-17.6	20.1	20.6	18.7	0.20
930525	0400	0.53	0.103	0.103	9.71	9.71	-12.0	-14.0	-18.4	20.9	20.9	19.0	0.16
930525	0700	0.49	0.103	0.103	9.71	9.71	-22.0	-22.0	-21.9	23.4	23.5	21.3	0.21
930525	1000	0.49	0.103	0.103	9.71	9.71	-16.0	-16.0	-22.7	21.3	21.7	18.6	0.21
930525	1300	0.49	0.103	0.103	9.71	9.71	-18.0	-18.0	-23.2	21.8	22.0	18.9	0.20
930525	1600	0.48	0.103	0.103	9.71	9.71	-14.0	-14.0	-19.9	20.3	19.9	18.7	0.18
930525	1900	0.51	0.103	0.103	9.71	9.71	-20.0	-14.0	-26.3	24.3	20.2	18.6	0.22
930525	2200	0.52	0.103	0.103	9.71	9.71	-26.0	-24.0	-29.4	24.5	19.9	18.3	0.22
930526	0100	0.50	0.103	0.103	9.71	9.71	-24.0	-24.0	-26.3	23.6	22.1	19.1	0.20
930526	0400	0.48	0.113	0.103	8.87	9.71	-24.0	-24.0	-23.4	22.4	20.2	20.0	0.18
930526	0700	0.50	0.103	0.103	9.71	9.71	-28.0	-28.0	-28.4	20.0	18.7	17.1	0.17
930526	1000	0.57	0.103	0.103	9.71	9.71	-24.0	-24.0	-11.5	43.6	22.7	17.0	0.19
930526	1300	0.95	0.113	0.210	8.87	4.75	-28.0	38.0	27.0	49.0	26.3	23.8	0.14
930526	1600	0.75	0.103	0.103	9.71	9.71	-26.0	-24.0	25.1	72.4	26.4	12.6	0.15
930526	1900	0.60	0.113	0.113	8.87	8.87	-32.0	-26.0	-1.3	59.2	23.0	14.5	0.18
930526	2200	0.55	0.113	0.103	8.87	9.71	-26.0	-26.0	-9.7	49.3	20.5	19.7	0.22
930527	0100	0.51	0.113	0.103	8.87	9.71	-24.0	-26.0	-17.5	31.5	20.5	18.2	0.23
930527	0400	0.51	0.113	0.113	8.87	8.87	-24.0	-24.0	-22.0	21.4	18.2	10.5	0.20
930527	0700	0.50	0.113	0.113	8.87	8.87	-24.0	-24.0	-23.9	19.9	18.4	12.2	0.20
930527	1000	0.51	0.113	0.113	8.87	8.87	-26.0	-24.0	-26.1	23.3	22.2	18.8	0.22
930527	1300	0.49	0.113	0.113	8.87	8.87	-20.0	-22.0	-21.8	20.3	20.3	19.1	0.23
930527	1600	0.48	0.103	0.103	9.71	9.71	-30.0	-30.0	-28.1	22.5	22.3	16.3	0.22
930527	1900	0.49	0.113	0.113	8.87	8.87	-26.0	-28.0	-27.5	18.1	17.5	13.9	0.19
930527	2200	0.49	0.113	0.113	8.87	8.87	-28.0	-28.0	-30.5	20.8	19.2	13.7	0.20
930528	0100	0.49	0.103	0.103	9.71	9.71	-26.0	-28.0	-32.0	22.2	20.3	21.4	0.21
930528	0400	0.52	0.113	0.113	8.87	8.87	-28.0	-28.0	-30.1	17.4	16.7	12.0	0.19
930528	0700	0.51	0.113	0.113	8.87	8.87	-22.0	-34.0	-29.9	16.7	16.3	16.5	0.18
930528	1000	0.50	0.113	0.113	8.87	8.87	-38.0	-36.0	-36.2	18.8	18.6	18.3	0.20
930528	1300	0.47	0.113	0.113	8.87	8.87	-30.0	-30.0	-33.2	18.8	18.0	13.3	0.21
930528	1600	0.46	0.103	0.113	9.71	8.87	-34.0	-32.0	-38.0	24.9	18.4	17.6	0.23
930528	1900	0.45	0.113	0.113	8.87	8.87	-32.0	-30.0	-35.2	18.9	15.1	13.4	0.23
930528	2200	0.44	0.113	0.113	8.87	8.87	-28.0	-30.0	-34.0	15.6	12.7	11.8	0.23
930529	0100	0.39	0.113	0.113	8.87	8.87	-32.0	-34.0	-34.0	14.5	14.5	11.9	0.23
930529	0400	0.37	0.113	0.113	8.87	8.87	-32.0	-32.0	-31.6	14.1	14.0	9.0	0.23
930529	0700	0.37	0.103	0.113	9.71	8.87	-32.0	-34.0	-34.3	15.3	15.5	12.8	0.22
930529	1000	0.38	0.113	0.113	8.87	8.87	-34.0	-34.0	-34.9	15.0	14.9	10.5	0.24
930529	1300	0.38	0.113	0.113	8.87	8.87	-34.0	-34.0	-38.4	19.4	18.4	15.1	0.24
930529	1600	0.39	0.103	0.103	9.71	9.71	-36.0	-34.0	-37.9	19.5	15.4	13.0	0.24
930529	1900	0.41	0.103	0.103	9.71	9.71	-34.0	-34.0	-37.9	19.2	22.5	11.8	0.21
930529	2200	0.51	0.113	0.113	8.87	8.87	-34.0	-32.0	-18.2	36.5	27.7	10.3	0.18
930530	0100	0.65	0.113	0.113	8.87	8.87	-36.0	-34.0	-10.5	44.3	32.1	14.1	0.16
930530	0400	0.70	0.103	0.269	9.71	3.72	-36.0	-34.0	-16.2	50.2	40.3	50.4	0.13
930530	0700	0.09	0.113	0.240	8.87	4.17	-36.0	-36.0	5.3	59.5	46.4	45.7	0.12
930530	1000	0.97	0.210	0.210	4.75	4.75	50.0	-36.0	17.4	71.1	57.5	66.7	0.15
930530	1300	0.94	0.191	0.201	5.24	4.98	38.0	34.0	17.3	66.9	44.3	40.9	0.15
930530	1600	0.88	0.181	0.181	5.52	5.52	44.0	44.0	22.9	61.6	29.6	16.9	0.20
930530	1900	0.79	0.171	0.171	5.83	5.83	34.0	42.0	18.5	59.8	33.1	23.1	0.14
930530	2200	0.78	0.113	0.171	8.87	5.83	-36.0	-36.0	6.4	58.9	45.2	47.4	0.14
930531	0100	0.72	0.113	0.113	8.87	8.87	-36.0	-36.0	-7.2	51.9	43.8	21.7	0.14
930531	0400	0.61	0.113	0.113	8.87	8.87	-34.0	-36.0	-15.2	48.9	39.9	13.9	0.16
930531	0700	0.53	0.113	0.113	8.87	8.87	-34.0	-34.0	-20.7	39.5	36.0	13.1	0.17
930531	1000	0.54	0.113	0.113	8.87	8.87	-12.0	-12.0	-18.8	25.1	27.7	19.4	0.15

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Table A1 (Continued)

Date	Time EST	H <sub>ms</sub> m	f <sub>ms</sub> Hz	f <sub>ms</sub> Hz	T <sub>ms</sub> sec	T <sub>ms</sub> sec	θ <sub>ms</sub> deg	θ <sub>ms</sub> deg	θ <sub>ms</sub> deg	Δθ <sub>ms</sub> deg	Δθ <sub>ms</sub> deg	Δθ <sub>ms</sub> deg	z
930531	1300	0.58	0.308	0.113	3.25	8.87	-54.0	-54.0	-28.5	34.3	22.9	21.0	0.23
930531	1600	0.53	0.113	0.113	8.87	8.87	-16.0	-54.0	-35.2	33.9	20.6	18.4	0.20
930531	1900	0.48	0.113	0.113	8.87	8.87	-26.0	-34.0	-33.7	28.1	21.6	20.5	0.18
930531	2200	0.53	0.210	0.113	4.75	8.87	-48.0	-34.0	-36.9	26.4	20.5	21.0	0.16
930601	0100	0.68	0.201	0.201	4.98	4.98	-50.0	-50.0	-45.5	22.7	18.8	15.0	0.17
930601	0400	0.66	0.171	0.181	5.83	5.52	-48.0	-54.0	-48.2	21.7	16.6	12.3	0.17
930601	0700	0.62	0.171	0.181	5.83	5.52	-56.0	-56.0	-10.1	88.5	25.2	9.5	0.16
930601	1000	1.22	0.191	0.191	5.24	5.24	30.0	30.0	34.5	20.7	19.6	11.6	0.11
930601	1300	1.23	0.181	0.181	5.52	5.52	28.0	26.0	24.4	25.8	25.2	14.8	0.14
930601	1600	1.01	0.171	0.171	5.83	5.83	32.0	28.0	20.3	32.1	29.0	14.2	0.15
930601	1900	0.71	0.162	0.171	6.19	5.83	28.0	28.0	17.1	51.3	34.2	18.0	0.15
930601	2200	0.57	0.171	0.171	5.83	5.83	26.0	28.0	11.4	56.0	38.6	15.5	0.16
930602	0100	0.56	0.083	0.083	11.98	11.98	-18.0	22.0	5.5	59.8	44.0	24.7	0.17
930602	0400	0.58	0.083	0.083	11.98	11.98	-16.0	-18.0	3.2	60.1	42.9	19.7	0.18
930602	0700	0.58	0.093	0.083	10.72	11.98	-16.0	-18.0	-4.3	54.6	42.2	24.0	0.18
930602	1000	0.61	0.093	0.093	10.72	10.72	-16.0	-20.0	-20.8	43.3	43.1	20.6	0.15
930602	1300	0.67	0.123	0.093	8.16	10.72	-36.0	-16.0	-29.9	37.3	37.2	26.1	0.15
930602	1600	0.68	0.123	0.123	8.16	8.16	-24.0	-24.0	-22.6	44.2	47.8	19.0	0.18
930602	1900	0.61	0.123	0.123	8.16	8.16	-20.0	-30.0	-17.3	42.7	42.4	18.6	0.19
930602	2200	0.62	0.132	0.132	7.56	7.56	-24.0	-22.0	-16.9	38.7	34.7	17.6	0.19
930603	0100	0.69	0.113	0.142	8.87	7.04	-40.0	-40.0	-19.0	38.6	37.5	26.2	0.15
930603	0400	0.78	0.113	0.113	8.87	8.87	-42.0	-40.0	-30.7	40.8	40.3	49.3	0.18
930603	0700	0.81	0.103	0.093	9.71	10.72	-36.0	-38.0	-31.1	38.0	38.3	36.7	0.20
930603	1000	0.85	0.103	0.103	9.71	9.71	-34.0	-34.0	-31.3	33.5	33.5	30.1	0.15
930603	1300	0.89	0.113	0.103	8.87	9.71	-30.0	-30.0	-26.3	33.7	30.0	33.8	0.15
930603	1600	0.99	0.113	0.103	8.87	9.71	-36.0	-36.0	-39.8	30.0	27.7	37.5	0.23
930603	1900	0.97	0.093	0.093	10.72	10.72	-34.0	-36.0	-38.9	25.3	25.0	23.7	0.21
930603	2200	0.85	0.093	0.093	10.72	10.72	-34.0	-34.0	-37.1	28.1	28.3	25.6	0.17
930604	0100	0.89	0.093	0.093	10.72	10.72	-32.0	-34.0	-34.6	26.8	26.5	21.8	0.13
930604	0400	0.94	0.103	0.103	9.71	9.71	-34.0	-30.0	-33.5	26.2	26.5	16.4	0.17
930604	0700	0.88	0.103	0.093	9.71	10.72	-38.0	-26.0	-30.0	24.4	23.8	24.2	0.18
930604	1000	0.74	0.113	0.103	8.87	9.71	-34.0	-24.0	-27.2	26.2	21.9	29.2	0.18
930604	1300	0.71	0.113	0.103	8.87	9.71	-24.0	-26.0	-23.2	26.6	20.7	21.5	0.17
930604	1600	0.76	0.113	0.113	8.87	8.87	-28.0	-26.0	-27.7	29.8	22.2	13.9	0.20
930604	1900	0.76	0.113	0.103	8.87	9.71	-24.0	-24.0	-20.7	33.3	28.3	20.8	0.21
930604	2200	0.89	0.103	0.103	9.71	9.71	-16.0	-18.0	2.2	39.9	33.2	22.9	0.16
930605	0100	0.88	0.083	0.083	11.98	11.98	-8.0	-8.0	-11.0	33.5	31.1	24.4	0.13
930605	0400	0.76	0.083	0.083	11.98	11.98	-10.0	-24.0	-16.5	32.0	28.5	24.5	0.16
930605	0700	0.68	0.083	0.083	11.98	11.98	-10.0	-12.0	-10.3	28.6	29.4	27.7	0.21
930605	1000	0.63	0.083	0.083	11.98	11.98	-4.0	4.0	-8.5	26.6	27.4	23.3	0.21
930605	1300	0.66	0.083	0.083	11.98	11.98	-6.0	0.0	-2.5	26.6	28.3	21.2	0.19
930605	1600	0.67	0.083	0.083	11.98	11.98	-10.0	-8.0	-11.1	27.1	29.3	24.2	0.19
930605	1900	0.60	0.083	0.083	11.98	11.98	-8.0	-10.0	-13.3	29.8	31.1	24.5	0.23
930605	2200	0.60	0.083	0.083	11.98	11.98	-8.0	-8.0	-16.7	30.7	31.8	23.0	0.24
930606	0100	1.00	0.279	0.289	3.59	3.47	56.0	54.0	36.6	37.4	14.3	7.6	0.30
930606	0400	1.19	0.230	0.220	4.35	4.54	48.0	48.0	39.4	19.7	13.8	8.6	0.24
930606	0700	1.15	0.201	0.201	4.98	4.98	44.0	44.0	37.4	22.7	15.0	11.4	0.23
930606	1000	1.03	0.181	0.191	5.52	5.24	36.0	38.0	37.6	22.6	15.5	10.2	0.21
930606	1300	0.84	0.201	0.201	4.98	4.98	44.0	44.0	27.9	33.0	17.7	9.8	0.14
930606	1600	0.75	0.181	0.191	5.52	5.24	28.0	30.0	23.8	36.7	21.4	18.7	0.14
930606	1900	0.65	0.191	0.191	5.24	5.24	36.0	32.0	23.8	39.4	24.9	14.2	0.16
930606	2200	0.52	0.201	0.201	4.98	4.98	36.0	36.0	15.2	49.3	26.5	13.0	0.20
930607	0100	0.44	0.093	0.093	10.72	10.72	-6.0	-12.0	8.7	45.8	26.3	24.1	0.21
930607	0400	0.42	0.083	0.093	11.98	10.72	-14.0	-14.0	3.5	39.2	28.3	26.3	0.22
930607	0700	0.41	0.093	0.093	10.72	10.72	-18.0	-16.0	1.4	35.0	31.2	24.2	0.21
930607	1000	0.38	0.083	0.083	11.98	11.98	-22.0	-16.0	-4.0	34.8	35.9	24.7	0.25
930607	1300	0.38	0.083	0.083	11.98	11.98	8.0	-16.0	-13.5	34.3	36.1	28.4	0.28
930607	1600	0.42	0.093	0.093	10.72	10.72	-26.0	-68.0	-36.8	45.9	25.8	22.7	0.24

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Table A1 (Continued)

Date	Time EST	$M_{\text{max}}$ m	$f_{\text{max}}$ Hz	$f_{\text{max}}$ Hz	$T_{\text{max}}$ sec	$T_{\text{max}}$ sec	$\theta_{\text{max}}$ deg	$\theta_{\text{max}}$ deg	$\theta_{\text{max}}$ deg	$\Delta\theta_{\text{max}}$ deg	$\Delta\theta_{\text{max}}$ deg	$\Delta\theta_{\text{max}}$ deg	$\chi$
930607	1900	0.41	0.093	0.093	10.72	10.72	-16.0	-66.0	-36.0	49.8	22.2	21.3	0.28
930607	2200	0.35	0.093	0.083	10.72	11.98	-20.0	-18.0	-28.1	36.0	24.9	22.7	0.28
930608	0100	0.35	0.093	0.083	10.72	11.98	-26.0	-12.0	-25.7	34.9	28.8	28.3	0.29
930608	0400	0.34	0.083	0.083	11.98	11.98	-12.0	-16.0	-21.7	34.2	28.1	28.2	0.30
930608	0700	0.35	0.093	0.093	10.72	10.72	-16.0	-16.0	-21.5	37.0	32.3	31.1	0.31
930608	1000	0.36	0.083	0.083	11.98	11.98	-10.0	14.0	-11.1	45.1	35.6	26.2	0.27
930608	1300	0.35	0.093	0.093	10.72	10.72	-28.0	-32.0	-24.6	44.0	34.6	30.2	0.27
930608	1600	0.37	0.093	0.093	10.72	10.72	-32.0	-34.0	-32.4	44.4	31.7	33.9	0.28
930608	1900	0.37	0.083	0.093	11.98	10.72	-6.0	-54.0	-32.8	45.6	26.9	32.2	0.29
930608	2200	0.33	0.191	0.093	5.24	10.72	-52.0	-52.0	-24.1	46.8	29.0	27.7	0.30
930609	0100	0.32	0.132	0.093	7.56	10.72	10.0	12.0	-17.4	43.3	34.1	26.5	0.27
930609	0400	0.34	0.132	0.093	7.56	10.72	4.0	6.0	-13.4	41.9	31.9	36.7	0.26
930609	0700	0.35	0.142	0.093	7.04	10.72	6.0	8.0	-25.1	45.0	33.0	28.4	0.27
930609	1000	0.32	0.093	0.093	10.72	10.72	-10.0	-38.0	-32.0	42.8	33.3	29.5	0.29
930609	1600	0.36	0.093	0.093	10.72	10.72	-8.0	-58.0	-37.3	47.2	24.7	26.9	0.28
930609	1900	0.33	0.318	0.093	3.15	10.72	-58.0	-58.0	-32.6	46.7	28.9	31.7	0.32
930609	2200	0.32	0.132	0.093	7.56	10.72	-42.0	-40.0	-22.5	43.8	29.7	29.5	0.33
930610	0100	0.31	0.093	0.093	10.72	10.72	16.0	-40.0	-22.8	45.1	29.2	36.8	0.28
930610	0400	0.30	0.093	0.093	10.72	10.72	4.0	-40.0	-26.7	42.1	26.9	27.6	0.32
930610	0700	0.31	0.123	0.093	8.16	10.72	-38.0	-38.0	-19.7	43.6	26.2	29.1	0.31
930610	1000	0.32	0.142	0.093	7.04	10.72	-42.0	-40.0	-18.6	44.1	34.0	33.0	0.32
930610	1300	0.30	0.103	0.103	9.71	9.71	-32.0	-32.0	-33.1	42.9	30.8	36.6	0.32
930610	1600	0.30	0.123	0.093	8.16	10.72	-38.0	-38.0	-24.9	41.1	29.7	28.3	0.31
930610	1900	0.30	0.132	0.103	7.56	9.71	-38.0	-38.0	-22.1	39.6	26.3	34.9	0.34
930610	2200	0.29	0.123	0.103	8.16	9.71	-36.0	-36.0	-27.1	32.3	24.3	34.2	0.35
930611	0100	0.29	0.113	0.093	8.87	10.72	-34.0	-36.0	-29.9	31.8	24.0	32.6	0.32
930611	0400	0.27	0.123	0.103	8.16	9.71	-38.0	-38.0	-29.5	34.6	24.8	30.4	0.33
930611	0700	0.26	0.113	0.103	8.87	9.71	-34.0	-34.0	-25.7	34.5	28.2	30.8	0.37
930611	1000	0.27	0.123	0.103	8.16	9.71	-36.0	-30.0	-26.4	38.8	30.4	35.2	0.38
930611	1300	0.28	0.113	0.113	8.87	8.87	-34.0	-34.0	-32.9	40.4	33.8	32.6	0.33
930611	1600	0.28	0.123	0.123	8.16	8.16	-36.0	-36.0	-26.5	40.0	33.3	11.2	0.30
930611	1900	0.28	0.123	0.123	8.16	8.16	-34.0	-36.0	-27.9	37.5	32.7	9.5	0.34
930611	2200	0.29	0.123	0.123	8.16	8.16	-36.0	-38.0	-27.5	37.9	33.8	7.0	0.34
930612	0100	0.29	0.123	0.123	8.16	8.16	-38.0	-38.0	-31.1	34.3	29.7	10.6	0.32
930612	0400	0.28	0.113	0.113	8.87	8.87	-26.0	-28.0	-23.4	35.7	30.5	19.1	0.31
930612	0700	0.29	0.123	0.113	8.16	8.87	-30.0	-28.0	-18.5	39.4	32.0	23.0	0.32
930612	1000	0.69	0.269	0.289	3.72	3.47	60.0	60.0	38.9	35.2	26.0	31.6	0.28
930612	1300	0.86	0.201	0.201	4.98	4.98	50.0	46.0	40.7	19.7	16.3	13.1	0.28
930612	1600	0.85	0.201	0.210	4.98	4.75	46.0	44.0	36.2	20.7	17.2	13.3	0.24
930612	1900	0.83	0.201	0.210	4.98	4.75	46.0	44.0	35.4	22.4	18.4	12.8	0.21
930612	2200	0.76	0.220	0.220	4.54	4.54	44.0	42.0	31.3	33.8	25.1	18.9	0.21
930613	0100	0.86	0.210	0.210	4.75	4.75	42.0	42.0	30.7	39.2	28.8	21.6	0.16
930613	0400	1.04	0.191	0.191	5.24	5.24	36.0	38.0	24.8	42.9	36.7	37.7	0.13
930613	0700	1.19	0.191	0.191	5.24	5.24	-2.0	38.0	20.4	38.7	32.1	38.0	0.14
930613	1000	1.11	0.201	0.201	4.98	4.98	36.0	38.0	20.8	34.0	27.4	27.5	0.16
930613	1300	1.01	0.210	0.201	4.75	4.98	42.0	42.0	25.0	35.7	28.3	29.6	0.18
930613	1600	1.11	0.210	0.201	4.75	4.98	16.0	22.0	21.1	30.6	26.4	24.6	0.17
930613	1900	1.35	0.181	0.191	5.52	5.24	20.0	6.0	18.5	31.7	25.4	29.1	0.14
930613	2200	1.36	0.171	0.181	5.83	5.52	-8.0	2.0	7.4	32.3	27.2	29.3	0.11
930614	0100	1.35	0.152	0.152	6.59	6.59	4.0	0.0	16.5	29.3	25.7	14.3	0.13
930614	0400	1.21	0.113	0.162	8.87	6.19	-4.0	-2.0	9.2	27.7	25.6	15.2	0.12
930614	0700	1.13	0.123	0.123	8.16	8.16	-2.0	12.0	15.0	25.7	23.4	16.9	0.13
930614	1000	1.08	0.123	0.123	8.16	8.16	-2.0	2.0	13.4	32.2	29.4	21.3	0.13
930614	1300	1.18	0.123	0.152	8.16	6.59	0.0	0.0	2.8	36.5	38.9	34.0	0.14
930614	1600	1.21	0.123	0.123	8.16	8.16	-4.0	-6.0	-12.5	38.3	40.7	29.6	0.14
930614	1900	1.08	0.123	0.142	8.16	7.04	0.0	0.0	-10.7	37.1	42.6	32.1	0.14
930614	2200	1.02	0.162	0.152	6.19	6.59	-2.0	-2.0	-6.2	35.8	39.6	30.7	0.12

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{s,ms}$ Hz	$T_{s,ms}$ sec	$T_{s,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\Delta\theta_{s,ms}$ deg	$\Delta\theta_{s,ms}$ deg	$\Delta\theta_{s,ms}$ deg	$x$
930615	0100	0.96	0.103	0.152	9.71	6.59	-24.0	-22.0	-21.2	33.1	36.4	20.8	0.13
930615	0400	0.86	0.103	0.103	9.71	9.71	-10.0	-14.0	-26.8	33.0	33.2	20.9	0.15
930615	0700	0.80	0.103	0.103	9.71	9.71	4.0	-14.0	-23.6	35.2	32.9	26.3	0.15
930615	1000	0.79	0.113	0.113	8.87	8.87	-18.0	-16.0	-27.4	36.1	31.7	19.6	0.15
930615	1300	0.84	0.123	0.123	8.16	8.16	-16.0	-16.0	-27.1	39.4	30.2	22.6	0.18
930615	1600	0.81	0.123	0.123	8.16	8.16	-14.0	-52.0	-32.9	38.2	28.5	20.6	0.17
930615	1900	0.67	0.132	0.132	7.56	7.56	-16.0	-24.0	-27.8	34.0	28.5	22.9	0.17
930615	2200	0.65	0.123	0.132	8.16	7.56	-14.0	-12.0	-25.5	32.3	25.5	20.9	0.15
930616	0100	0.65	0.162	0.152	6.19	6.59	-44.0	-44.0	-26.2	35.2	24.8	23.5	0.18
930616	0400	0.65	0.152	0.142	6.59	7.04	-36.0	-20.0	-26.2	34.6	25.8	27.6	0.20
930616	0700	0.64	0.132	0.142	7.56	7.04	-26.0	-22.0	-27.1	30.9	25.0	23.9	0.18
930616	1000	0.66	0.142	0.142	7.04	7.04	-20.0	-20.0	-23.5	27.3	25.8	21.5	0.17
930616	1300	0.67	0.152	0.152	6.59	6.59	-22.0	-22.0	-22.6	25.9	26.6	19.8	0.19
930616	1600	0.62	0.132	0.132	7.56	7.56	-38.0	-40.0	-31.3	31.1	23.7	22.0	0.22
930616	1900	0.57	0.142	0.142	7.04	7.04	-38.0	-14.0	-30.0	31.7	24.2	23.7	0.22
930616	2200	0.57	0.132	0.123	7.56	8.16	-14.0	-14.0	-26.1	30.3	26.2	30.5	0.19
930617	0100	0.60	0.132	0.132	7.56	7.56	-36.0	-14.0	-34.5	30.7	28.4	23.6	0.19
930617	0400	0.60	0.132	0.132	7.56	7.56	-38.0	-40.0	-35.6	32.5	29.1	23.8	0.23
930617	0700	0.55	0.142	0.074	7.04	13.56	-38.0	-14.0	-30.8	29.3	27.4	31.8	0.22
930617	1000	0.54	0.132	0.074	7.56	13.56	-30.0	-30.0	-29.0	27.5	25.4	23.0	0.21
930617	1300	0.53	0.123	0.074	8.16	13.56	-36.0	-38.0	-29.9	30.0	24.9	27.7	0.25
930617	1600	0.53	0.074	0.074	13.56	13.56	-14.0	-16.0	-28.9	30.7	23.8	29.3	0.26
930617	1900	0.51	0.074	0.074	13.56	13.56	-14.0	-16.0	-26.4	30.9	27.7	27.1	0.25
930617	2200	0.54	0.083	0.083	11.98	11.98	-10.0	-28.0	-27.1	27.9	24.3	19.5	0.21
930618	0100	0.56	0.083	0.083	11.98	11.98	-10.0	-28.0	-26.1	28.6	23.0	19.6	0.21
930618	0400	0.59	0.113	0.083	8.87	11.98	-38.0	-28.0	-28.0	27.0	23.9	21.2	0.23
930618	0700	0.58	0.123	0.083	8.16	11.98	-24.0	-26.0	-25.5	27.2	22.8	25.0	0.21
930618	1000	0.55	0.132	0.123	7.56	8.16	-24.0	-24.0	-24.3	25.7	23.1	17.8	0.21
930618	1300	0.54	0.123	0.083	8.16	11.98	-28.0	-26.0	-28.9	28.3	25.2	27.9	0.22
930618	1600	0.58	0.083	0.083	11.98	11.98	-10.0	-26.0	-29.1	30.8	22.7	21.3	0.23
930618	1900	0.54	0.132	0.123	7.56	8.16	-24.0	-26.0	-29.3	29.3	22.4	18.3	0.23
930618	2200	0.52	0.123	0.083	8.16	11.98	-22.0	-18.0	-27.1	26.3	21.9	24.1	0.21
930619	0100	0.52	0.123	0.083	8.16	11.98	-16.0	-16.0	-27.6	24.2	21.5	20.8	0.19
930619	0400	0.50	0.113	0.083	8.87	11.98	-36.0	-20.0	-28.6	26.1	22.8	24.5	0.23
930619	0700	0.47	0.113	0.083	8.87	11.98	-34.0	-34.0	-31.3	26.6	21.6	26.5	0.22
930619	1000	0.46	0.113	0.083	8.87	11.98	-34.0	-34.0	-29.6	27.1	22.5	27.4	0.21
930619	1300	0.48	0.113	0.083	8.87	11.98	-34.0	-18.0	-31.2	27.6	22.0	20.0	0.21
930619	1600	0.58	0.298	0.113	3.35	8.87	-54.0	-54.0	-40.4	34.6	19.2	23.1	0.32
930619	1900	0.54	0.308	0.103	3.25	9.71	-56.0	-56.0	-39.5	33.6	16.9	17.1	0.28
930619	2200	0.45	0.113	0.093	8.87	10.72	-34.0	-36.0	-30.5	27.5	19.3	20.7	0.24
930620	0100	0.44	0.103	0.093	9.71	10.72	-32.0	-34.0	-33.5	23.4	18.2	22.3	0.21
930620	0400	0.44	0.113	0.103	8.87	9.71	-34.0	-34.0	-34.8	24.9	21.0	23.5	0.23
930620	0700	0.43	0.103	0.103	9.71	9.71	-30.0	-32.0	-33.6	26.6	25.6	17.3	0.23
930620	1000	0.41	0.103	0.103	9.71	9.71	-30.0	-30.0	-32.3	24.1	21.5	19.4	0.24
930620	1300	0.44	0.103	0.103	9.71	9.71	-34.0	-34.0	-33.6	22.6	21.2	20.4	0.21
930620	1600	0.46	0.113	0.113	8.87	8.87	-34.0	-34.0	-35.0	23.6	18.0	12.8	0.27
930620	1900	0.49	0.103	0.103	9.71	9.71	-34.0	-34.0	-36.8	20.8	14.6	11.8	0.28
930620	2200	0.45	0.103	0.103	9.71	9.71	-34.0	-34.0	-36.5	20.5	17.8	17.3	0.23
930621	0100	0.46	0.113	0.103	8.87	9.71	-36.0	-36.0	-37.3	16.3	15.4	14.0	0.20
930621	0400	0.47	0.103	0.103	9.71	9.71	-36.0	-34.0	-36.7	20.3	19.3	16.3	0.20
930621	0700	0.50	0.113	0.113	8.87	8.87	-28.0	-36.0	-37.8	20.2	18.3	15.1	0.21
930621	1000	0.46	0.103	0.103	9.71	9.71	-32.0	-32.0	-37.4	22.3	18.1	13.5	0.21
930621	1300	0.50	0.103	0.113	9.71	8.87	-34.0	-34.0	-37.2	17.5	15.9	10.5	0.18
930621	1600	0.54	0.113	0.113	8.87	8.87	-34.0	-34.0	-42.5	24.0	14.2	14.0	0.23
930621	1900	0.57	0.113	0.103	8.87	9.71	-36.0	-56.0	-45.1	23.7	12.3	15.9	0.33
930621	2200	0.46	0.113	0.113	8.87	8.87	-36.0	-38.0	-42.6	24.2	14.6	12.1	0.23
930622	0100	0.48	0.103	0.103	9.71	9.71	-32.0	-34.0	-39.0	20.3	15.0	17.2	0.18
930622	0400	0.44	0.113	0.113	8.87	8.87	-34.0	-34.0	-37.5	21.1	19.0	15.3	0.21

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Table A1 (Continued)

Date	Time EST	$N_m$ m	$f_{A,0}$ Hz	$f_{A,0}$ Hz	$T_{A,0}$ sec	$T_{A,0}$ sec	$\theta_{A,0}$ deg	$\theta_{A,0}$ deg	$\theta_{A,0}$ deg	$\Delta\theta_{A,0}$ deg	$\Delta\theta_{A,0}$ deg	$\Delta\theta_{A,0}$ deg	$\lambda$
930622	0700	0.42	0.113	0.113	8.87	8.87	-28.0	-34.0	-37.7	22.1	19.3	14.6	0.23
930622	1000	0.66	0.318	0.318	3.15	3.15	-54.0	-38.0	-39.4	63.0	60.9	83.7	0.41
930622	1300	0.38	0.113	0.113	8.87	8.87	-36.0	-36.0	-34.1	22.5	22.6	14.4	0.23
930622	1600	0.41	0.113	0.113	8.87	8.87	-36.0	-34.0	-36.1	23.5	23.2	17.0	0.24
930622	1900	0.43	0.113	0.113	8.87	8.87	-36.0	-36.0	-41.3	23.3	19.6	15.1	0.25
930622	2200	0.40	0.113	0.113	8.87	8.87	-36.0	-38.0	-40.7	29.2	21.6	17.3	0.25
930623	0100	0.39	0.113	0.113	8.87	8.87	-32.0	-32.0	-37.0	23.9	20.1	12.8	0.21
930623	0400	0.39	0.113	0.113	8.87	8.87	-24.0	-38.0	-30.6	25.8	28.2	16.6	0.23
930623	0700	1.04	0.250	0.230	4.01	4.35	12.0	14.0	14.8	26.8	24.1	21.9	0.12
930623	1000	1.32	0.171	0.171	5.83	5.83	36.0	36.0	33.0	27.6	27.2	12.2	0.15
930623	1300	1.14	0.171	0.162	5.83	6.19	30.0	30.0	31.6	31.1	27.2	23.8	0.13
930623	1600	1.01	0.152	0.152	6.59	6.59	28.0	24.0	23.1	26.1	23.6	14.0	0.16
930623	1900	0.91	0.142	0.142	7.04	7.04	30.0	26.0	17.3	24.5	23.1	20.3	0.16
930623	2200	0.80	0.152	0.142	6.59	7.04	32.0	22.0	19.4	28.9	25.3	19.2	0.16
930624	0100	0.71	0.152	0.152	6.59	6.59	32.0	34.0	16.3	42.2	29.6	23.2	0.13
930624	0400	0.63	0.113	0.171	8.87	5.83	-34.0	30.0	15.7	58.2	26.5	19.8	0.12
930624	0700	0.62	0.113	0.113	8.87	8.87	-36.0	-36.0	5.9	59.3	31.9	18.5	0.15
930624	1000	0.58	0.113	0.113	8.87	8.87	-34.0	-36.0	-1.1	55.8	37.8	29.5	0.18
930624	1300	0.50	0.123	0.123	8.16	8.16	-40.0	-38.0	-10.1	49.3	36.2	27.8	0.22
930624	1600	0.50	0.123	0.123	8.16	8.16	-36.0	-36.0	-19.1	39.7	31.2	25.8	0.18
930624	1900	0.53	0.123	0.142	8.16	7.04	-38.0	-38.0	-22.2	37.0	34.3	31.6	0.19
930624	2200	0.49	0.113	0.142	8.87	7.04	-34.0	-36.0	-12.3	42.6	38.3	33.8	0.20
930625	0100	0.47	0.113	0.113	8.87	8.87	-38.0	-40.0	-22.0	42.5	33.8	14.1	0.22
930625	0400	0.47	0.113	0.113	8.87	8.87	-34.0	-32.0	-18.0	39.8	31.1	11.3	0.18
930625	0700	0.50	0.123	0.132	8.16	7.56	-38.0	-40.0	-11.3	51.7	34.1	28.3	0.19
930625	1000	0.50	0.113	0.123	8.87	8.16	-34.0	-34.0	-18.0	49.9	49.9	22.4	0.20
930625	1300	0.46	0.123	0.113	8.16	8.87	-40.0	-38.0	-40.2	45.8	52.9	27.7	0.21
930625	1600	0.46	0.123	0.123	8.16	8.16	-40.0	-38.0	-50.9	40.6	41.0	19.1	0.25
930625	1900	0.57	0.123	0.123	8.16	8.16	-34.0	-34.0	-44.7	36.2	27.0	16.2	0.20
930625	2200	0.63	0.210	0.210	4.75	4.75	-58.0	-40.0	-45.5	35.8	30.1	18.5	0.17
930626	0100	0.65	0.143	0.201	8.87	4.98	-34.0	-42.0	-40.9	34.9	28.8	17.2	0.16
930626	0400	0.65	0.191	0.103	5.24	9.71	-56.0	-36.0	-40.0	35.3	28.1	28.7	0.15
930626	0700	0.72	0.181	0.181	5.52	5.52	-56.0	-56.0	-38.1	38.9	27.3	19.3	0.14
930626	1000	0.73	0.191	0.191	5.24	5.24	-58.0	-34.0	-42.0	36.2	27.4	25.6	0.16
930626	1300	0.88	0.308	0.191	3.25	5.24	-66.0	-64.0	-51.2	30.6	22.5	20.4	0.20
930626	1600	0.83	0.171	0.171	5.83	5.83	-50.0	-50.0	-48.3	27.9	22.4	19.1	0.15
930626	1900	0.81	0.171	0.171	5.83	5.83	-48.0	-50.0	-42.1	28.8	20.5	14.7	0.14
930626	2200	0.86	0.171	0.171	5.83	5.83	-54.0	-52.0	-42.1	29.6	19.6	14.6	0.16
930627	0100	0.77	0.162	0.162	6.19	6.19	-48.0	-48.0	-43.3	29.4	19.3	12.7	0.17
930627	0400	0.73	0.171	0.162	5.83	6.19	-50.0	-48.0	-39.6	31.4	17.7	13.6	0.14
930627	0700	0.73	0.162	0.103	6.19	9.71	-50.0	-50.0	-37.9	32.3	20.1	17.8	0.12
930627	1000	0.77	0.103	0.103	9.71	9.71	-20.0	-50.0	-36.9	32.5	21.3	16.3	0.18
930627	1300	0.73	0.103	0.103	9.71	9.71	-12.0	-16.0	-31.1	37.6	29.9	15.2	0.18
930627	1600	0.64	0.103	0.103	9.71	9.71	-14.0	-14.0	-30.9	36.9	30.3	14.3	0.18
930627	1900	0.63	0.162	0.103	6.19	9.71	-48.0	-48.0	-33.4	34.2	24.6	17.2	0.15
930627	2200	0.68	0.171	0.113	5.83	8.87	-50.0	-50.0	-36.3	33.3	21.9	14.1	0.16
930628	0100	0.65	0.152	0.103	6.59	9.71	-48.0	-48.0	-39.0	35.4	28.4	12.6	0.18
930628	0400	0.62	0.113	0.113	8.87	8.87	-14.0	-46.0	-30.6	44.7	45.3	15.0	0.16
930628	0700	0.59	0.123	0.123	8.16	8.16	-30.0	-40.0	-14.0	40.3	34.7	16.6	0.15
930628	1000	0.71	0.132	0.132	7.56	7.56	-30.0	-30.0	-14.9	34.9	31.4	13.0	0.17
930628	1300	0.64	0.132	0.142	7.56	7.04	-32.0	-32.0	-22.1	38.6	30.5	18.4	0.22
930628	1600	0.56	0.132	0.132	7.56	7.56	-32.0	-34.0	-23.5	33.6	29.7	15.0	0.23
930628	1900	0.56	0.142	0.142	7.04	7.04	-44.0	-32.0	-37.5	28.5	26.3	16.7	0.19
930628	2200	0.62	0.152	0.152	6.59	6.59	-46.0	-46.0	-40.9	26.0	21.8	15.8	0.18
930629	0100	0.59	0.132	0.152	7.56	6.59	-30.0	-40.0	-39.1	26.3	21.8	18.0	0.21
930629	0400	0.51	0.152	0.142	6.59	7.04	-44.0	-44.0	-38.3	31.1	25.1	21.8	0.22
930629	0700	0.49	0.152	0.152	6.59	6.59	-44.0	-42.0	-37.8	34.0	29.8	25.9	0.18
930629	1000	0.50	0.162	0.162	6.19	6.19	-44.0	-38.0	-37.3	31.1	27.6	22.4	0.18

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,0}$ Hz	$f_{s,10}$ Hz	$T_{s,0}$ sec	$T_{s,10}$ sec	$\theta_{s,0}$ deg	$\theta_{s,10}$ deg	$\theta_{s,20}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{10}$ deg	$\Delta\theta_{20}$ deg	$\lambda$
930629	1300	0.51	0.152	0.152	6.59	6.59	-42.0	-34.0	-39.7	31.4	26.3	17.9	0.23
930629	1600	0.45	0.162	0.123	6.19	8.16	-44.0	-36.0	-39.5	28.8	24.5	21.7	0.24
930629	1900	0.41	0.103	0.103	9.71	9.71	-32.0	-30.0	-34.9	31.0	28.5	23.9	0.24
930629	2200	0.41	0.113	0.113	8.87	8.87	-34.0	-32.0	-37.3	29.3	25.8	22.8	0.21
930630	0100	0.47	0.123	0.113	8.16	8.87	-30.0	-30.0	-38.8	30.2	28.8	27.1	0.22
930630	0400	0.47	0.113	0.113	8.87	8.87	-34.0	-34.0	-36.0	29.9	31.2	18.2	0.19
930630	0700	0.44	0.132	0.113	7.56	8.87	-28.0	-30.0	-32.1	26.1	25.5	19.7	0.18
930630	1000	0.46	0.113	0.113	8.87	8.87	-30.0	-32.0	-30.7	28.1	24.9	22.2	0.18
930630	1300	0.47	0.113	0.113	8.87	8.87	-36.0	-36.0	-35.5	27.4	25.1	16.1	0.21
930630	1600	0.46	0.113	0.113	8.87	8.87	-32.0	-36.0	-36.4	26.4	25.9	14.2	0.22
930630	1900	0.44	0.103	0.113	9.71	8.87	-36.0	-36.0	-38.7	31.9	29.7	19.0	0.20
930630	2200	0.46	0.113	0.113	8.87	8.87	-36.0	-36.0	-34.5	32.5	30.3	14.8	0.17
930701	0100	0.48	0.113	0.113	8.87	8.87	-32.0	-34.0	-34.7	33.3	32.5	17.4	0.18
930701	0400	0.44	0.113	0.113	8.87	8.87	-34.0	-38.0	-36.6	36.7	35.7	23.8	0.20
930701	0700	0.41	0.113	0.113	8.87	8.87	-36.0	-36.0	-35.1	29.5	30.7	17.4	0.19
930701	1000	0.41	0.113	0.113	8.87	8.87	-36.0	-36.0	-33.7	33.4	30.9	18.1	0.20
930701	1300	0.42	0.113	0.113	8.87	8.87	-30.0	-36.0	-27.0	38.2	34.3	30.4	0.21
930701	1600	0.44	0.113	0.113	8.87	8.87	-34.0	-36.0	-21.9	46.1	37.8	29.2	0.24
930701	1900	0.66	0.289	0.298	3.47	3.35	22.0	50.0	12.8	54.0	35.0	32.2	0.18
930701	2200	0.67	0.269	0.269	3.72	3.72	48.0	50.0	23.7	62.2	34.3	31.4	0.17
930702	0100	0.61	0.240	0.240	4.17	4.17	46.0	46.0	18.9	62.3	34.7	22.3	0.14
930702	0400	0.57	0.230	0.230	4.35	4.35	46.0	46.0	14.6	67.1	32.6	19.6	0.16
930702	0700	0.55	0.230	0.230	4.35	4.35	46.0	46.0	9.2	66.4	29.8	15.7	0.15
930702	1000	0.59	0.201	0.220	4.98	4.54	26.0	26.0	8.1	54.6	30.7	17.8	0.13
930702	1300	0.73	0.191	0.191	5.24	5.24	18.0	20.0	11.8	46.3	32.5	20.2	0.12
930702	1600	0.77	0.171	0.171	5.83	5.83	16.0	18.0	10.2	40.1	33.2	15.0	0.15
930702	1900	0.66	0.162	0.162	6.19	6.19	12.0	12.0	6.7	39.3	30.8	17.4	0.16
930702	2200	0.55	0.142	0.142	7.04	7.04	10.0	12.0	4.8	46.2	42.9	26.9	0.13
930703	0100	0.53	0.152	0.152	6.59	6.59	12.0	12.0	-12.3	46.3	41.5	18.8	0.15
930703	0400	0.52	0.103	0.162	9.71	6.19	-18.0	-18.0	-1.4	46.3	43.0	50.2	0.19
930703	0700	0.53	0.113	0.152	8.87	6.59	-16.0	-16.0	-7.1	43.3	38.1	30.6	0.20
930703	1000	0.53	0.103	0.103	9.71	9.71	-20.0	6.0	-4.1	37.4	33.2	19.7	0.15
930703	1300	0.57	0.103	0.103	9.71	9.71	-12.0	-12.0	-10.7	34.6	34.0	14.9	0.14
930703	1600	0.56	0.113	0.113	8.87	8.87	-14.0	-46.0	-25.9	39.5	32.4	19.2	0.20
930703	1900	0.54	0.103	0.113	9.71	8.87	-34.0	-48.0	-41.6	41.9	27.0	31.0	0.25
930703	2200	0.49	0.113	0.103	8.87	9.71	-38.0	-38.0	-36.9	42.4	29.5	29.8	0.21
930704	0100	0.48	0.103	0.113	9.71	8.87	-34.0	-36.0	-29.9	36.3	35.0	28.8	0.16
930704	0400	0.50	0.113	0.113	8.87	8.87	-34.0	-34.0	-24.0	35.3	37.3	29.0	0.18
930704	0700	0.53	0.113	0.113	8.87	8.87	-34.0	-36.0	-32.8	40.9	40.3	29.6	0.18
930704	1000	0.51	0.103	0.113	9.71	8.87	-34.0	-34.0	-34.2	40.6	37.1	24.6	0.17
930704	1300	0.51	0.103	0.113	9.71	8.87	-32.0	-36.0	-39.5	39.7	32.9	25.4	0.15
930704	1600	0.51	0.113	0.113	8.87	8.87	-38.0	-38.0	-41.1	35.0	29.1	25.4	0.20
930704	1900	0.47	0.103	0.113	9.71	8.87	-32.0	-34.0	-40.6	37.0	31.1	30.8	0.23
930704	2200	0.46	0.113	0.103	8.87	9.71	-38.0	-36.0	-36.7	34.5	33.1	24.4	0.21
930705	0100	0.44	0.113	0.113	8.87	8.87	-36.0	-38.0	-31.4	35.5	34.9	20.1	0.19
930705	0400	0.47	0.103	0.113	9.71	8.87	-32.0	-30.0	-31.5	31.1	32.1	21.1	0.20
930705	0700	0.45	0.103	0.113	9.71	8.87	-30.0	-28.0	-26.8	36.9	35.7	23.7	0.24
930705	1000	0.45	0.103	0.113	9.71	8.87	-34.0	-34.0	-33.1	30.8	33.1	21.6	0.25
930705	1300	0.44	0.113	0.113	8.87	8.87	-30.0	-28.0	-31.6	26.6	26.9	15.5	0.21
930705	1600	0.49	0.123	0.113	8.16	8.87	-30.0	-30.0	-29.3	21.2	22.5	13.6	0.20
930705	1900	0.48	0.113	0.113	8.87	8.87	-28.0	-28.0	-29.4	29.0	27.3	14.1	0.24
930705	2200	0.47	0.113	0.113	8.87	8.87	-28.0	-30.0	-34.0	28.6	28.7	15.4	0.24
930706	0100	0.44	0.113	0.113	8.87	8.87	-30.0	-30.0	-31.5	28.6	29.2	14.4	0.23
930706	0400	0.44	0.123	0.113	8.16	8.87	-26.0	-28.0	-30.9	27.9	28.2	23.6	0.22
930706	0700	0.44	0.113	0.113	8.87	8.87	-38.0	-26.0	-33.3	29.6	29.5	18.8	0.26
930706	1000	0.43	0.113	0.113	8.87	8.87	-34.0	-34.0	-31.4	29.7	29.6	17.3	0.27
930706	1300	0.41	0.113	0.113	8.87	8.87	-38.0	-38.0	-37.8	32.6	32.3	24.7	0.26
930706	1600	0.55	0.113	0.113	8.87	8.87	-26.0	-30.0	-46.1	41.1	23.6	18.0	0.26

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{s,0}$ Hz	$f_{s,10}$ Hz	$T_{s,0}$ sec	$T_{s,10}$ sec	$\theta_{s,0}$ deg	$\theta_{s,10}$ deg	$\theta_{s,20}$ deg	$\Delta\theta_{s,0}$ deg	$\Delta\theta_{s,10}$ deg	$\Delta\theta_{s,20}$ deg	$\chi$
930706	1900	0.51	0.113	0.113	8.87	8.87	-34.0	-34.0	-44.6	33.3	27.0	15.9	0.23
930706	2200	0.45	0.113	0.113	8.87	8.87	-34.0	-36.0	-40.7	26.8	25.1	16.3	0.22
930707	0100	0.43	0.113	0.113	8.87	8.87	-28.0	-28.0	-35.3	28.3	24.3	14.9	0.20
930707	0400	0.45	0.113	0.113	8.87	8.87	-34.0	-34.0	-35.4	23.6	21.7	14.1	0.18
930707	0700	0.44	0.113	0.113	8.87	8.87	-34.0	-34.0	-34.6	28.1	26.8	18.8	0.22
930707	1000	0.41	0.113	0.113	8.87	8.87	-34.0	-34.0	-26.7	30.2	28.0	15.9	0.22
930707	1300	0.42	0.113	0.113	8.87	8.87	-26.0	-28.0	-28.4	28.5	25.6	16.4	0.21
930707	1600	0.54	0.103	0.113	9.71	8.87	-28.0	-40.0	-38.5	25.6	20.4	18.8	0.20
930707	1900	0.51	0.269	0.103	3.72	9.71	-60.0	-60.0	-44.5	30.0	19.7	15.7	0.23
930707	2200	0.44	0.103	0.113	9.71	8.87	-30.0	-28.0	-39.9	28.6	20.2	18.9	0.23
930708	0100	0.39	0.103	0.103	9.71	9.71	-30.0	-28.0	-37.4	32.7	22.6	21.9	0.23
930708	0400	0.40	0.113	0.103	8.87	9.71	-34.0	-22.0	-31.8	27.6	23.8	23.0	0.20
930708	0700	0.44	0.113	0.103	8.87	9.71	-16.0	-14.0	-20.9	29.1	26.9	28.2	0.21
930708	1000	0.51	0.113	0.103	8.87	9.71	-16.0	-14.0	-19.9	25.9	22.9	19.9	0.22
930708	1300	0.55	0.103	0.103	9.71	9.71	-12.0	-12.0	-18.1	21.5	20.8	14.4	0.24
930708	1600	0.56	0.103	0.103	9.71	9.71	-14.0	-12.0	-17.3	19.5	20.0	13.9	0.22
930708	1900	0.56	0.103	0.103	9.71	9.71	-12.0	-12.0	-19.6	20.7	17.7	12.6	0.20
930708	2200	0.49	0.103	0.103	9.71	9.71	-12.0	-12.0	-21.7	28.0	18.3	12.2	0.20
930709	0100	0.44	0.113	0.103	8.87	9.71	-14.0	-12.0	-25.6	30.3	26.0	19.7	0.26
930709	0400	0.39	0.103	0.113	9.71	8.87	-14.0	-22.5	-28.0	24.2	23.1	0.23	0.23
930709	0700	0.36	0.103	0.113	9.71	8.87	-18.0	-18.0	-25.2	32.6	27.0	28.9	0.23
930709	1000	0.33	0.113	0.113	8.87	8.87	-30.0	-28.0	-34.1	31.8	28.0	22.8	0.21
930709	1300	0.30	0.113	0.113	8.87	8.87	-30.0	-30.0	-33.1	31.3	27.2	18.5	0.26
930709	1600	0.27	0.113	0.113	8.87	8.87	-30.0	-30.0	-31.1	30.3	24.9	20.6	0.25
930709	1900	0.26	0.123	0.113	8.16	8.87	-28.0	-28.0	-30.0	37.3	31.0	25.3	0.31
930709	2200	0.25	0.113	0.113	8.87	8.87	-32.0	-30.0	-40.1	40.2	30.7	22.8	0.30
930710	0100	0.25	0.113	0.113	8.87	8.87	-22.0	-40.0	-41.4	46.1	30.4	25.6	0.32
930710	0400	0.27	0.113	0.113	8.87	8.87	-26.0	-26.0	-34.4	46.2	33.2	29.7	0.33
930710	0700	0.27	0.113	0.113	8.87	8.87	-28.0	-30.0	-26.5	43.1	32.1	28.2	0.31
930710	1000	0.28	0.113	0.113	8.87	8.87	-24.0	-24.0	-26.6	47.9	32.1	30.1	0.26
930710	1300	0.28	0.093	0.113	10.72	8.87	-4.0	0.0	-32.4	49.0	29.9	32.6	0.28
930710	1600	0.26	0.093	0.093	10.72	10.72	0.0	-34.0	-27.7	46.6	33.6	22.0	0.38
930710	1900	0.27	0.103	0.093	9.71	10.72	10.0	-28.0	-24.8	45.8	31.4	24.7	0.33
930710	2200	0.27	0.093	0.093	10.72	10.72	-10.0	-10.0	-14.6	43.3	42.8	24.2	0.33
930711	0100	0.26	0.093	0.103	10.72	9.71	-8.0	-34.0	-26.8	44.2	35.9	29.6	0.29
930711	0400	0.27	0.103	0.103	9.71	9.71	2.0	2.0	-19.2	45.8	34.5	28.4	0.36
930711	0700	0.27	0.113	0.113	8.87	8.87	6.0	8.0	-22.6	47.9	34.6	32.0	0.36
930711	1000	0.27	0.093	0.103	10.72	9.71	-8.0	-2.0	-27.1	55.3	33.3	33.3	0.31
930711	1300	0.30	0.191	0.103	5.24	9.71	-64.0	-64.0	-41.9	64.5	32.3	32.8	0.28
930711	1600	0.25	0.132	0.103	7.56	9.71	-28.0	-28.0	-38.3	57.1	36.8	38.0	0.33
930711	1900	0.26	0.123	0.103	8.16	9.71	-26.0	-28.0	-23.3	44.1	31.3	32.7	0.34
930711	2200	0.25	0.123	0.103	8.16	9.71	-28.0	-30.0	-27.3	43.2	28.8	23.8	0.32
930712	0100	0.23	0.103	0.103	9.71	9.71	10.0	-34.0	-25.2	46.9	36.0	32.8	0.33
930712	0400	0.23	0.103	0.103	9.71	9.71	4.0	6.0	-30.1	47.4	36.0	31.8	0.40
930712	0700	0.27	0.103	0.103	9.71	9.71	2.0	4.0	-32.1	58.3	29.5	34.0	0.38
930712	1000	0.27	0.113	0.103	8.87	9.71	-36.0	-36.0	-34.6	53.8	26.2	35.8	0.31
930712	1300	0.27	0.113	0.103	8.87	9.71	-30.0	-58.0	-38.4	56.7	26.0	40.2	0.28
930712	1600	0.27	0.103	0.103	9.71	9.71	-32.0	-34.0	-39.0	53.4	28.7	38.2	0.29
930712	1900	0.27	0.093	0.113	10.72	8.87	10.0	-34.0	-28.7	47.9	27.9	35.8	0.33
930712	2200	0.28	0.093	0.113	10.72	8.87	14.0	-32.0	-29.6	48.7	23.9	28.3	0.32
930713	0100	0.30	0.113	0.113	8.87	8.87	-32.0	-54.0	-33.2	49.3	27.1	23.2	0.28
930713	0400	0.29	0.113	0.113	8.87	8.87	-36.0	-56.0	-41.5	47.3	26.9	26.9	0.29
930713	0700	0.29	0.123	0.113	8.16	8.87	-34.0	-32.0	-32.2	44.4	28.6	27.2	0.34
930713	1300	0.56	0.113	0.250	8.87	4.01	-32.0	-50.0	-34.2	79.8	67.9	50.6	0.20
930713	1600	0.50	0.083	0.083	11.98	11.98	-26.0	-34.0	3.7	75.5	45.0	20.3	0.21
930713	2200	0.39	0.093	0.093	10.72	10.72	-32.0	34.0	-33.7	25.6	29.9	11.3	0.29
930714	0100	0.44	0.093	0.093	10.72	10.72	-30.0	-30.0	-36.7	19.9	14.3	8.8	0.30

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Table A1 (Continued)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{s,ms}$ Hz	$T_{s,ms}$ sec	$T_{s,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\lambda$
930714	0400	0.46	0.093	0.093	10.72	10.72	-30.0	-32.0	-39.7	22.7	15.1	11.9	0.29
930714	0700	0.44	0.103	0.103	9.71	9.71	-30.0	-30.0	-37.7	15.4	14.4	8.7	0.30
930714	1000	0.46	0.103	0.103	9.71	9.71	-30.0	-32.0	-36.9	13.9	13.1	10.0	0.24
930714	1300	0.47	0.103	0.103	9.71	9.71	-28.0	-28.0	-38.5	27.4	13.7	11.8	0.23
930714	1600	0.45	0.103	0.103	9.71	9.71	-36.0	-36.0	-43.2	28.5	13.2	12.7	0.24
930714	1900	0.45	0.103	0.103	9.71	9.71	-36.0	-58.0	-45.4	26.7	13.1	15.8	0.27
930714	2200	0.39	0.103	0.103	9.71	9.71	-32.0	-36.0	-41.8	27.3	14.2	12.3	0.28
930715	0100	0.33	0.113	0.113	8.87	8.87	-26.0	-28.0	-35.6	22.4	17.7	14.5	0.27
930715	0700	0.30	0.113	0.113	8.87	8.87	-38.0	-38.0	-37.5	25.7	23.7	15.4	0.29
930715	1000	0.31	0.113	0.113	8.87	8.87	-36.0	-36.0	-39.2	25.9	24.9	14.6	0.23
930715	1600	0.37	0.142	0.113	7.04	8.87	-44.0	-50.0	-42.2	28.1	20.4	15.9	0.27
930715	1900	0.34	0.113	0.113	8.87	8.87	-34.0	-50.0	-38.2	38.2	27.5	15.9	0.26
930715	2200	0.30	0.113	0.113	8.87	8.87	-32.0	-44.0	-37.7	42.0	35.0	22.2	0.28
930716	0100	0.27	0.142	0.113	7.04	8.87	-42.0	-42.0	-21.9	45.1	40.5	34.3	0.34
930716	0400	0.28	0.132	0.113	7.56	8.87	-40.0	-40.0	-11.3	57.6	34.9	34.5	0.31
930716	0700	0.64	0.269	0.289	3.72	3.47	30.0	30.0	18.5	34.5	30.0	27.8	0.18
930716	1000	0.70	0.230	0.230	4.35	4.35	42.0	40.0	22.7	43.4	34.3	29.5	0.15
930716	1300	0.55	0.220	0.220	4.54	4.54	44.0	42.0	17.6	60.7	43.6	39.0	0.19
930716	1600	0.53	0.210	0.210	4.75	4.75	48.0	50.0	28.5	83.2	58.7	37.2	0.20
930716	1900	0.45	0.201	0.181	4.98	5.52	44.0	44.0	30.2	47.3	32.1	18.7	0.19
930716	2200	0.52	0.191	0.191	5.24	5.24	42.0	44.0	32.0	30.9	22.3	10.9	0.15
930717	0100	0.47	0.181	0.181	5.52	5.52	38.0	40.0	23.8	40.5	27.0	15.0	0.18
930717	0400	0.38	0.201	0.201	4.98	4.98	30.0	30.0	9.7	58.4	36.8	21.6	0.22
930717	0700	0.35	0.210	0.210	4.75	4.75	24.0	24.0	12.4	50.7	31.7	12.5	0.24
930717	1000	0.42	0.318	0.318	3.15	3.15	54.0	54.0	28.2	44.9	23.2	11.9	0.23
930717	1300	0.46	0.250	0.250	4.01	4.01	58.0	58.0	40.0	42.1	25.3	19.8	0.23
930717	1600	0.50	0.220	0.220	4.54	4.54	54.0	54.0	41.2	35.6	24.8	19.3	0.22
930717	1900	0.47	0.210	0.210	4.75	4.75	52.0	50.0	35.5	37.5	23.1	15.7	0.18
930717	2200	0.54	0.171	0.181	5.83	5.52	30.0	32.0	31.7	24.6	20.5	11.6	0.15
930718	0100	0.66	0.181	0.181	5.52	5.52	30.0	30.0	28.1	23.0	21.1	13.6	0.13
930718	0400	0.69	0.181	0.191	5.52	5.24	28.0	28.0	27.4	23.8	22.8	17.6	0.14
930718	0700	0.56	0.181	0.181	5.52	5.52	30.0	32.0	26.9	28.4	22.5	10.9	0.15
930718	1000	0.42	0.181	0.181	5.52	5.52	36.0	36.0	26.9	47.8	25.4	13.6	0.15
930718	1300	0.35	0.181	0.181	5.52	5.52	38.0	38.0	16.4	59.1	37.3	46.3	0.20
930718	1600	0.35	0.201	0.191	4.98	5.24	44.0	-24.0	11.6	59.2	52.5	61.0	0.28
930718	1900	0.40	0.171	0.171	5.83	5.83	20.0	20.0	5.7	49.8	45.1	37.5	0.23
930718	2200	0.40	0.191	0.191	5.24	5.24	14.0	14.0	-1.0	43.1	38.5	21.7	0.17
930719	0100	0.56	0.298	0.318	3.35	3.15	-64.0	-64.0	-42.4	46.2	26.4	21.0	0.24
930719	0400	0.70	0.289	0.269	3.47	3.72	-58.0	-58.0	-47.0	23.2	18.4	16.1	0.33
930719	0700	0.56	0.259	0.259	3.86	3.86	-58.0	-58.0	-48.5	22.3	18.2	15.3	0.23
930719	1000	0.53	0.318	0.230	3.15	4.35	-58.0	-58.0	-50.0	23.6	16.2	16.5	0.18
930719	1300	0.52	0.250	0.250	4.01	4.01	-56.0	-58.0	-48.0	24.3	14.5	11.9	0.24
930719	1600	0.60	0.308	0.230	3.25	4.35	-56.0	-56.0	-46.4	26.1	15.8	18.7	0.22
930719	1900	0.61	0.210	0.210	4.75	4.75	-52.0	-52.0	-40.1	26.2	16.2	18.8	0.19
930719	2200	0.53	0.191	0.191	5.24	5.24	-50.0	-52.0	-41.7	28.3	17.7	15.5	0.15
930720	0100	0.50	0.181	0.181	5.52	5.52	-46.0	-48.0	-46.7	20.1	14.6	9.8	0.14
930720	0400	0.49	0.181	0.181	5.52	5.52	-52.0	-52.0	-50.0	21.1	15.9	14.5	0.15
930720	0700	0.42	0.191	0.181	5.24	5.52	-54.0	-52.0	-46.6	24.8	19.1	12.4	0.19
930720	1000	0.37	0.162	0.171	6.19	5.83	-46.0	-46.0	-43.4	22.7	17.6	12.0	0.20
930720	1300	0.36	0.171	0.171	5.83	5.83	-48.0	-50.0	-42.4	29.3	21.7	13.6	0.18
930720	1600	0.43	0.181	0.181	5.52	5.52	-52.0	-52.0	-47.5	26.1	22.4	15.4	0.19
930720	1900	0.42	0.181	0.181	5.52	5.52	-38.0	-38.0	-37.8	21.9	22.3	13.7	0.24
930720	2200	0.37	0.171	0.171	5.83	5.83	-46.0	-46.0	-43.0	24.4	21.1	10.3	0.20
930721	0100	0.32	0.142	0.142	7.04	7.04	-40.0	-40.0	-42.0	28.5	21.2	8.6	0.18
930721	0400	0.36	0.142	0.142	7.04	7.04	-42.0	-42.0	-43.4	30.3	29.2	14.6	0.21
930721	0700	0.40	0.152	0.142	6.59	7.04	-48.0	-48.0	-44.8	33.7	29.6	17.7	0.24
930721	1000	0.39	0.142	0.152	7.04	6.59	-46.0	-46.0	-31.7	43.2	32.6	16.2	0.22
930721	1600	0.51	0.259	0.259	3.86	3.86	46.0	46.0	11.7	74.6	26.6	15.0	0.22

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Table A1 (Continued)

Date	Time EST	$H_m$ m	$f_{s,0}$ Hz	$f_{s,10}$ Hz	$T_{s,0}$ sec	$T_{s,10}$ sec	$\theta_{s,0}$ deg	$\theta_{s,10}$ deg	$\theta_{s,20}$ deg	$\Delta\theta_{0-10}$ deg	$\Delta\theta_{10-20}$ deg	$\Delta\theta_{0-20}$ deg	$\lambda$
930721	1900	0.49	0.210	0.210	4.75	4.75	40.0	44.0	10.5	77.3	37.5	19.5	0.24
930721	2200	0.38	0.220	0.210	4.54	4.75	46.0	46.0	9.4	70.5	34.5	15.7	0.26
930722	0100	0.35	0.123	0.103	8.16	9.71	-36.0	-36.0	-5.3	59.5	31.5	30.5	0.23
930722	0400	0.36	0.123	0.123	8.16	8.16	-30.0	-36.0	-13.3	47.2	34.5	33.0	0.26
930722	0700	0.38	0.093	0.083	10.72	11.98	-14.0	-2.0	-16.4	42.7	39.1	20.0	0.32
930722	1000	0.37	0.083	0.083	11.98	11.98	-10.0	-10.0	-12.1	45.5	34.7	17.4	0.30
930722	1300	0.35	0.113	0.083	8.87	11.98	-20.0	-32.0	-7.1	48.1	37.7	25.5	0.26
930722	1600	0.53	0.269	0.269	3.72	3.72	46.0	46.0	18.6	44.2	25.6	20.4	0.23
930722	1900	0.44	0.279	0.279	3.59	3.59	46.0	48.0	11.3	51.9	30.2	23.9	0.34
930722	2200	0.36	0.123	0.093	8.16	10.72	-30.0	14.0	-0.8	55.9	34.2	27.7	0.34
930723	0100	0.34	0.093	0.093	10.72	10.72	-18.0	2.0	-11.9	42.5	35.5	28.4	0.26
930723	0400	0.32	0.103	0.103	9.71	9.71	-30.0	6.0	-16.7	37.4	38.3	29.4	0.29
930723	0700	0.37	0.093	0.093	10.72	10.72	-4.0	-14.0	0.1	54.3	37.2	20.4	0.32
930723	1000	0.38	0.279	0.093	3.59	10.72	50.0	48.0	9.4	65.5	37.0	26.8	0.30
930723	1300	0.29	0.093	0.093	10.72	10.72	-16.0	-28.0	-11.6	40.7	38.5	24.2	0.32
930723	1600	0.28	0.113	0.103	8.87	9.71	-30.0	-30.0	-20.5	33.6	34.5	28.6	0.33
930723	1900	0.34	0.093	0.103	10.72	9.71	-20.0	-24.0	-27.5	32.2	30.2	33.6	0.34
930723	2200	0.38	0.113	0.103	8.87	9.71	-36.0	-32.0	-28.0	29.0	28.6	33.1	0.30
930724	0100	0.36	0.113	0.103	8.87	9.71	-26.0	-28.0	-24.4	27.6	27.9	25.6	0.27
930724	0400	0.38	0.093	0.103	10.72	9.71	-16.0	-24.0	-17.4	35.2	36.0	22.4	0.23
930724	0700	0.67	0.250	0.250	4.01	4.01	-28.0	-28.0	-26.0	25.7	25.7	17.5	0.18
930724	1000	0.64	0.220	0.220	4.54	4.54	-30.0	-28.0	-27.6	20.3	21.7	13.7	0.22
930724	1300	0.56	0.191	0.201	5.24	4.98	-42.0	-38.0	-33.5	18.9	19.9	15.3	0.19
930724	1600	0.55	0.171	0.103	5.83	9.71	-40.0	-38.0	-35.3	17.5	18.2	28.8	0.16
930724	1900	0.54	0.103	0.103	9.71	9.71	-20.0	-36.0	-33.0	20.2	19.1	20.1	0.17
930724	2200	0.56	0.103	0.103	9.71	9.71	-24.0	-34.0	-31.1	18.5	19.3	15.2	0.21
930725	0100	0.50	0.103	0.103	9.71	9.71	-24.0	-34.0	-31.0	18.6	18.4	14.1	0.21
930725	0400	0.45	0.113	0.103	8.87	9.71	-24.0	-34.0	-30.6	24.2	22.9	27.0	0.21
930725	0700	0.42	0.113	0.113	8.87	8.87	-34.0	-22.0	-30.9	25.1	24.6	25.6	0.23
930725	1000	0.46	0.103	0.113	9.71	8.87	-24.0	-26.0	-39.3	32.4	26.5	28.3	0.29
930725	1300	0.47	0.113	0.103	8.87	9.71	-24.0	-24.0	-38.8	34.3	30.2	23.2	0.27
930725	1600	0.51	0.103	0.103	9.71	9.71	-30.0	-28.0	-38.7	28.4	31.6	22.6	0.24
930725	1900	0.55	0.132	0.113	7.56	8.87	-38.0	-26.0	-24.7	30.2	33.3	19.7	0.21
930725	2200	0.63	0.103	0.103	9.71	9.71	-26.0	-26.0	-5.8	55.5	33.7	15.9	0.19
930726	0100	0.63	0.103	0.240	9.71	4.17	-26.0	4.0	0.3	48.4	29.5	24.7	0.17
930726	0400	0.80	0.201	0.210	4.98	4.75	24.0	16.0	12.0	30.9	22.6	15.6	0.12
930726	0700	1.01	0.181	0.181	5.52	5.52	12.0	10.0	8.5	25.7	23.6	13.1	0.11
930726	1000	1.07	0.191	0.191	5.24	5.24	8.0	8.0	4.9	36.6	33.0	22.7	0.14
930726	1300	1.08	0.191	0.181	5.24	5.52	8.0	-26.0	-5.8	36.3	32.8	29.3	0.16
930726	1600	1.05	0.152	0.152	6.59	6.59	-30.0	-28.0	-10.9	36.1	34.2	28.2	0.15
930726	1900	1.01	0.152	0.152	6.59	6.59	-2.0	-2.0	-4.0	37.6	37.5	34.5	0.14
930726	2200	1.07	0.162	0.162	6.19	6.19	-28.0	-28.0	-16.4	42.1	42.1	36.2	0.13
930727	0100	1.01	0.132	0.152	7.56	6.59	-6.0	-42.0	-20.8	47.4	42.5	31.5	0.16
930727	0400	0.89	0.152	0.152	6.59	6.59	8.0	-4.0	-20.7	43.9	39.7	23.9	0.12
930727	0700	0.84	0.142	0.142	7.04	7.04	10.0	10.0	-19.6	44.0	40.4	29.3	0.11
930727	1300	0.78	0.123	0.113	8.16	8.87	0.0	0.0	-22.0	42.2	33.8	28.3	0.17
930727	1600	0.68	0.113	0.113	8.87	8.87	-36.0	-36.0	-35.7	37.0	31.7	32.7	0.18
930727	1900	0.66	0.113	0.113	8.87	8.87	-28.0	-36.0	-32.8	32.9	27.0	27.2	0.14
930727	2200	0.64	0.113	0.113	8.87	8.87	-6.0	-34.0	-28.9	31.8	24.3	25.6	0.18
930728	0100	0.64	0.123	0.123	8.16	8.16	0.0	-28.0	-22.0	33.4	27.8	25.9	0.21
930728	0400	0.63	0.132	0.103	7.56	9.71	-6.0	-26.0	-15.9	31.1	27.9	30.1	0.22
930728	0700	0.59	0.103	0.113	9.71	8.87	-8.0	-32.0	-26.8	32.7	30.7	31.4	0.18
930728	1000	0.62	0.113	0.113	8.87	8.87	-18.0	-18.0	-21.3	28.4	26.0	26.8	0.19
930728	1300	0.59	0.103	0.113	9.71	8.87	-16.0	-18.0	-25.5	30.7	28.9	28.0	0.23
930728	1600	0.55	0.113	0.103	8.87	9.71	-36.0	-36.0	-31.8	33.0	31.5	31.8	0.26
930728	1900	0.54	0.093	0.103	10.72	9.71	-34.0	-34.0	-30.0	30.9	29.4	25.8	0.23
930728	2200	0.56	0.113	0.113	8.87	8.87	-12.0	-14.0	-24.7	30.9	30.6	26.1	0.21

(Sheet 45 of 47)

Table A1 (Continued)

Date	Time EST	H <sub>m</sub> m	f <sub>AP</sub> Hz	f <sub>AP</sub> Hz	T <sub>AP</sub> sec	T <sub>AP</sub> sec	θ <sub>AP</sub> deg	θ <sub>AP</sub> deg	θ <sub>AP</sub> deg	Δθ <sub>AP</sub> deg	Δθ <sub>AP</sub> deg	Δθ <sub>AP</sub> deg	X
930729	0100	0.56	0.103	0.103	9.71	9.71	-32.0	-14.0	-30.7	30.6	30.1	24.4	0.24
930729	0400	0.51	0.103	0.103	9.71	9.71	-20.0	-20.0	-20.0	31.4	30.4	25.6	0.27
930729	0700	0.49	0.103	0.103	9.71	9.71	-18.0	-36.0	-27.1	30.2	28.1	22.5	0.25
930729	1000	0.48	0.113	0.113	8.87	8.87	-36.0	-34.0	-32.0	27.6	25.4	24.2	0.22
930729	1900	0.45	0.103	0.113	9.71	8.87	-20.0	-20.0	-35.4	32.7	27.7	25.3	0.31
930729	2200	0.39	0.113	0.113	8.87	8.87	-32.0	-26.0	-33.4	31.6	30.1	28.4	0.29
930730	0100	0.38	0.113	0.113	8.87	8.87	-34.0	-32.0	-34.4	32.8	30.1	29.4	0.30
930730	0400	0.40	0.103	0.113	9.71	8.87	-28.0	-28.0	-38.1	35.8	28.1	32.4	0.28
930730	0700	0.44	0.132	0.113	7.56	8.87	-40.0	-40.0	-39.5	37.9	27.5	30.0	0.27
930730	1000	0.47	0.113	0.113	8.87	8.87	-28.0	-24.0	-39.7	38.6	26.8	21.7	0.22
930730	1300	0.45	0.113	0.113	8.87	8.87	-26.0	-24.0	-33.1	36.7	33.0	18.8	0.26
930730	1600	0.43	0.142	0.113	7.04	8.87	-44.0	-24.0	-34.8	33.1	30.7	18.9	0.24
930730	1900	0.40	0.142	0.103	7.04	9.71	-44.0	-24.0	-38.3	35.2	29.5	22.2	0.26
930730	2200	0.39	0.142	0.113	7.04	8.87	-42.0	-22.0	-35.5	36.4	30.4	26.4	0.24
930731	0100	0.55	0.318	0.318	3.15	3.15	62.0	60.0	16.2	75.7	29.5	18.6	0.25
930731	0400	0.94	0.250	0.250	4.01	4.01	34.0	54.0	34.2	25.4	21.5	20.6	0.24
930731	0700	0.90	0.210	0.210	4.75	4.75	32.0	32.0	35.7	26.5	23.1	15.0	0.19
930731	1000	0.76	0.210	0.210	4.75	4.75	34.0	34.0	32.8	26.1	20.7	12.1	0.15
930731	1300	0.67	0.210	0.210	4.75	4.75	46.0	46.0	32.9	39.5	24.3	18.0	0.13
930731	1600	0.58	0.201	0.210	4.98	4.75	44.0	48.0	16.7	64.1	26.2	21.1	0.18
930731	1900	0.55	0.201	0.152	4.98	6.59	42.0	-26.0	7.5	63.3	26.4	18.5	0.19
930731	2200	0.52	0.210	0.103	4.75	9.71	36.0	-28.0	1.5	51.2	29.1	26.6	0.14
930801	0100	0.53	0.162	0.162	6.19	6.19	-14.0	-18.0	-2.1	33.3	28.3	19.7	0.15
930801	0400	0.54	0.152	0.152	6.59	6.59	-16.0	-20.0	-10.7	29.2	28.7	21.8	0.23
930801	0700	0.46	0.103	0.152	9.71	6.59	-30.0	-20.0	-14.0	33.4	31.6	22.9	0.25
930801	1000	0.41	0.181	0.113	5.52	8.87	-36.0	-34.0	-20.7	35.6	31.7	30.7	0.21
930801	1300	0.40	0.181	0.113	5.52	8.87	-38.0	-36.0	-29.8	34.6	31.6	29.7	0.22
930801	1600	0.44	0.171	0.162	5.83	6.19	-40.0	-40.0	-32.1	38.0	29.7	36.4	0.24
930801	1900	0.48	0.289	0.103	3.47	9.71	-64.0	-64.0	-38.0	41.9	25.0	28.7	0.28
930801	2200	0.39	0.113	0.113	8.87	8.87	-34.0	-34.0	-37.2	37.6	28.2	29.7	0.23
930802	0100	0.37	0.113	0.113	8.87	8.87	-20.0	-34.0	-34.3	37.7	27.5	23.3	0.25
930802	0400	0.37	0.113	0.113	8.87	8.87	-28.0	-58.0	-37.1	43.0	25.5	29.6	0.30
930802	0700	0.35	0.113	0.113	8.87	8.87	-30.0	-60.0	-39.5	39.9	25.0	32.7	0.28
930802	1000	0.36	0.123	0.123	8.16	8.16	-30.0	-36.0	-37.3	31.7	23.9	28.4	0.26
930802	1300	0.55	0.142	0.142	7.04	7.04	-44.0	-38.0	-39.5	17.8	15.7	16.9	0.20
930802	1600	0.65	0.142	0.142	7.04	7.04	-40.0	-40.0	-41.7	15.6	15.6	12.9	0.22
930802	1900	0.48	0.123	0.132	8.16	7.56	-42.0	-42.0	-40.5	19.1	18.1	14.4	0.24
930802	2200	0.39	0.142	0.142	7.04	7.04	-28.0	-28.0	-31.0	18.3	17.5	11.2	0.22
930803	0100	0.37	0.152	0.142	6.59	7.04	-28.0	-30.0	-33.0	18.3	16.9	15.0	0.20
930803	0400	0.39	0.142	0.132	7.04	7.56	-40.0	-32.0	-32.1	18.3	18.2	13.3	0.24
930803	0700	0.42	0.142	0.142	7.04	7.04	-40.0	-30.0	-36.7	20.0	19.1	15.1	0.26
930803	1000	0.39	0.132	0.132	7.56	7.56	-40.0	-40.0	-35.2	21.4	20.4	13.5	0.24
930803	1300	0.52	0.250	0.250	4.01	4.01	-54.0	-44.0	-44.0	25.2	17.8	8.8	0.20
930803	1600	0.39	0.269	0.123	3.72	8.16	-62.0	-62.0	-40.3	29.3	16.9	14.6	0.27
930803	1900	0.43	0.152	0.152	6.59	6.59	-44.0	-28.0	-42.1	29.6	17.7	15.9	0.28
930803	2200	0.39	0.113	0.113	8.87	8.87	-34.0	-26.0	-37.8	23.1	19.9	11.3	0.25
930804	0100	0.40	0.142	0.142	7.04	7.04	-44.0	-44.0	-40.3	22.3	17.4	16.2	0.21
930804	0400	0.44	0.113	0.113	8.87	8.87	-34.0	-28.0	-39.5	22.7	17.0	12.2	0.22
930804	0700	0.43	0.113	0.113	8.87	8.87	-26.0	-26.0	-38.3	27.9	21.1	13.4	0.28
930804	1000	0.45	0.123	0.113	8.16	8.87	-24.0	-24.0	-38.4	29.0	20.4	15.0	0.26
930804	1300	0.39	0.113	0.113	8.87	8.87	-32.0	-24.0	-33.8	24.2	23.0	14.1	0.28
930804	1600	0.44	0.142	0.142	7.04	7.04	-44.0	-44.0	-38.2	24.4	19.8	11.1	0.24
930804	1900	0.56	0.152	0.142	6.59	7.04	-46.0	-46.0	-42.5	23.2	13.2	7.6	0.23
930804	2200	0.55	0.152	0.113	6.59	8.87	-48.0	-46.0	-45.8	26.2	14.1	17.2	0.22
930805	0100	0.43	0.113	0.113	8.87	8.87	-32.0	-54.0	-41.2	34.9	17.6	16.4	0.25
930805	0400	0.40	0.132	0.113	7.56	8.87	-40.0	-40.0	-39.1	31.5	21.9	25.6	0.29
930805	1000	0.79	0.240	0.240	4.17	4.17	34.0	32.0	22.0	28.7	21.1	18.4	0.17
930805	1300	0.66	0.210	0.220	4.75	4.54	30.0	32.0	17.4	48.8	25.3	18.2	0.14

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Table A1 (Concluded)

Date	Time EST	$H_{ms}$ m	$f_{s,ms}$ Hz	$f_{s,ms}$ Hz	$T_{s,ms}$ sec	$T_{s,ms}$ sec	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\theta_{s,ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\Delta\theta_{ms}$ deg	$\lambda$
930805	1600	0.57	0.132	0.210	7.56	4.75	-40.0	18.0	2.5	53.7	34.4	26.3	0.17
930805	1900	0.51	0.103	0.103	9.71	9.71	-26.0	-20.0	-2.6	59.4	35.3	19.4	0.22
930805	2200	0.46	0.103	0.103	9.71	9.71	-18.0	-16.0	-0.4	55.5	36.1	20.0	0.25
930806	0100	0.43	0.103	0.103	9.71	9.71	-18.0	-16.0	2.4	51.1	33.0	21.1	0.27
930806	0400	0.44	0.103	0.113	9.71	8.87	-16.0	-16.0	-5.4	49.8	27.6	25.1	0.26
930806	0700	0.42	0.103	0.113	9.71	8.87	-20.0	-20.0	-15.5	42.4	32.3	29.3	0.32
930806	1000	0.42	0.113	0.113	8.87	8.87	-18.0	-18.0	-21.7	38.1	37.8	27.3	0.28
930806	1300	0.77	0.279	0.259	3.59	3.86	-62.0	-40.0	-47.5	28.2	22.3	24.6	0.19
930806	1600	0.62	0.181	0.269	5.52	3.72	-48.0	-48.0	-45.4	23.8	17.5	15.0	0.21
930806	1900	0.57	0.171	0.171	5.83	5.83	-48.0	-50.0	-46.6	25.8	15.8	7.3	0.21
930806	2200	0.44	0.171	0.171	5.83	5.83	-52.0	-52.0	-45.2	31.5	24.6	17.1	0.26
930807	0100	0.37	0.132	0.132	7.56	7.56	-46.0	-46.0	-27.9	40.7	28.1	10.6	0.29
930807	0400	0.43	0.132	0.132	7.56	7.56	-44.0	48.0	-1.4	79.3	28.7	21.5	0.29
930807	0700	0.88	0.152	0.152	6.59	6.59	30.0	36.0	30.4	23.6	21.9	10.0	0.21
930807	1000	1.21	0.152	0.142	6.59	7.04	28.0	28.0	34.3	20.0	19.6	17.6	0.16
930807	1300	1.07	0.123	0.123	8.16	8.16	32.0	26.0	28.4	21.3	21.6	17.4	0.13
930807	1600	0.94	0.113	0.113	8.87	8.87	22.0	22.0	21.8	24.5	23.2	20.4	0.14
930807	1900	0.97	0.113	0.113	8.87	8.87	16.0	16.0	19.7	23.3	21.8	17.2	0.18
930807	2200	1.04	0.123	0.123	8.16	8.16	10.0	12.0	17.5	18.6	18.3	13.9	0.18
930808	0100	1.02	0.123	0.113	8.16	8.87	8.0	12.0	16.3	18.8	18.8	15.4	0.14
930808	0400	1.00	0.132	0.123	7.56	8.16	18.0	12.0	14.9	18.3	19.2	14.3	0.13
930808	0700	0.95	0.123	0.123	8.16	8.16	6.0	16.0	13.6	20.5	19.6	14.0	0.15
930808	1000	0.82	0.123	0.113	8.16	8.87	14.0	14.0	14.0	21.6	20.3	17.9	0.19
930808	1300	0.69	0.113	0.113	8.87	8.87	16.0	16.0	12.3	28.2	25.7	22.3	0.18
930808	1600	0.67	0.132	0.113	7.56	8.87	12.0	14.0	10.9	33.4	28.9	35.5	0.15
930808	1900	0.81	0.123	0.123	8.16	8.16	6.0	16.0	3.9	32.8	30.9	26.7	0.14
930808	2200	0.96	0.132	0.123	7.56	8.16	12.0	-10.0	4.7	32.3	32.8	23.0	0.14
930809	0100	0.93	0.132	0.142	7.56	7.04	14.0	14.0	1.9	33.2	33.3	27.6	0.12
930809	0400	0.80	0.132	0.162	7.56	6.19	-8.0	8.0	0.8	30.2	29.6	25.7	0.12
930809	0700	0.79	0.113	0.113	8.87	8.87	-2.0	-2.0	0.2	31.2	29.4	27.0	0.12
930809	1000	0.82	0.113	0.113	8.87	8.87	2.0	2.0	3.3	30.6	28.7	17.7	0.15
930809	1300	0.95	0.123	0.181	8.16	5.52	12.0	10.0	4.8	30.9	29.6	31.0	0.13
930809	1600	1.16	0.162	0.171	6.19	5.83	-24.0	10.0	1.6	31.1	29.3	26.3	0.10
930809	1900	1.19	0.181	0.162	5.52	6.19	2.0	2.0	4.7	31.7	32.1	29.5	0.10
930809	2200	1.07	0.181	0.171	5.52	5.83	-12.0	0.0	1.6	31.5	32.6	29.9	0.14
930810	0100	0.93	0.191	0.191	5.24	5.24	2.0	6.0	6.5	31.1	31.8	24.2	0.14
930810	0400	0.88	0.132	0.123	7.56	8.16	-4.0	6.0	5.3	30.6	30.4	23.4	0.11
930810	0700	0.95	0.113	0.162	8.87	6.19	4.0	4.0	4.8	31.0	29.9	25.6	0.11
930810	1000	1.00	0.181	0.181	5.52	5.52	0.0	0.0	3.3	33.0	32.4	28.1	0.15
930810	1300	1.02	0.181	0.191	5.52	5.24	2.0	2.0	2.7	31.3	30.7	28.5	0.14
930810	1600	0.91	0.152	0.152	6.59	6.59	0.0	0.0	1.9	31.6	31.4	25.3	0.11
930810	1900	0.85	0.113	0.152	8.87	6.59	0.0	0.0	-0.9	30.9	28.7	26.1	0.10
930810	2200	0.78	0.132	0.152	7.56	6.59	-8.0	-14.0	5.3	33.4	31.2	24.1	0.13
930811	0100	0.72	0.123	0.123	8.16	8.16	-6.0	2.0	1.1	31.6	31.6	17.1	0.14
930811	0400	0.75	0.123	0.113	8.16	8.87	0.0	0.0	3.2	27.5	28.3	23.9	0.12
930811	0700	0.99	0.113	0.113	8.87	8.87	-2.0	-2.0	-0.2	20.2	20.6	11.9	0.12
930811	1000	1.18	0.113	0.113	8.87	8.87	2.0	2.0	0.9	20.8	20.3	18.4	0.16
930811	1300	1.02	0.113	0.113	8.87	8.87	6.0	8.0	6.1	22.7	22.7	17.3	0.19
930811	1600	0.88	0.093	0.103	10.72	9.71	10.0	8.0	6.5	25.7	24.9	19.2	0.17
930811	1900	0.77	0.132	0.113	7.56	8.87	-16.0	10.0	-0.7	28.6	29.1	23.0	0.13
930811	2200	0.77	0.123	0.113	8.16	8.87	-16.0	-4.0	-3.2	29.5	30.0	25.9	0.15
930812	0100	0.76	0.123	0.113	8.16	8.87	4.0	4.0	1.6	31.6	31.5	28.2	0.17
930812	0700	0.74	0.113	0.113	8.87	8.87	-36.0	2.0	-8.6	32.7	30.3	35.0	0.12

(Sheet 47 of 47)

# **Appendix B**

## **Time Series Graphs of Bulk**

### **Parameters**

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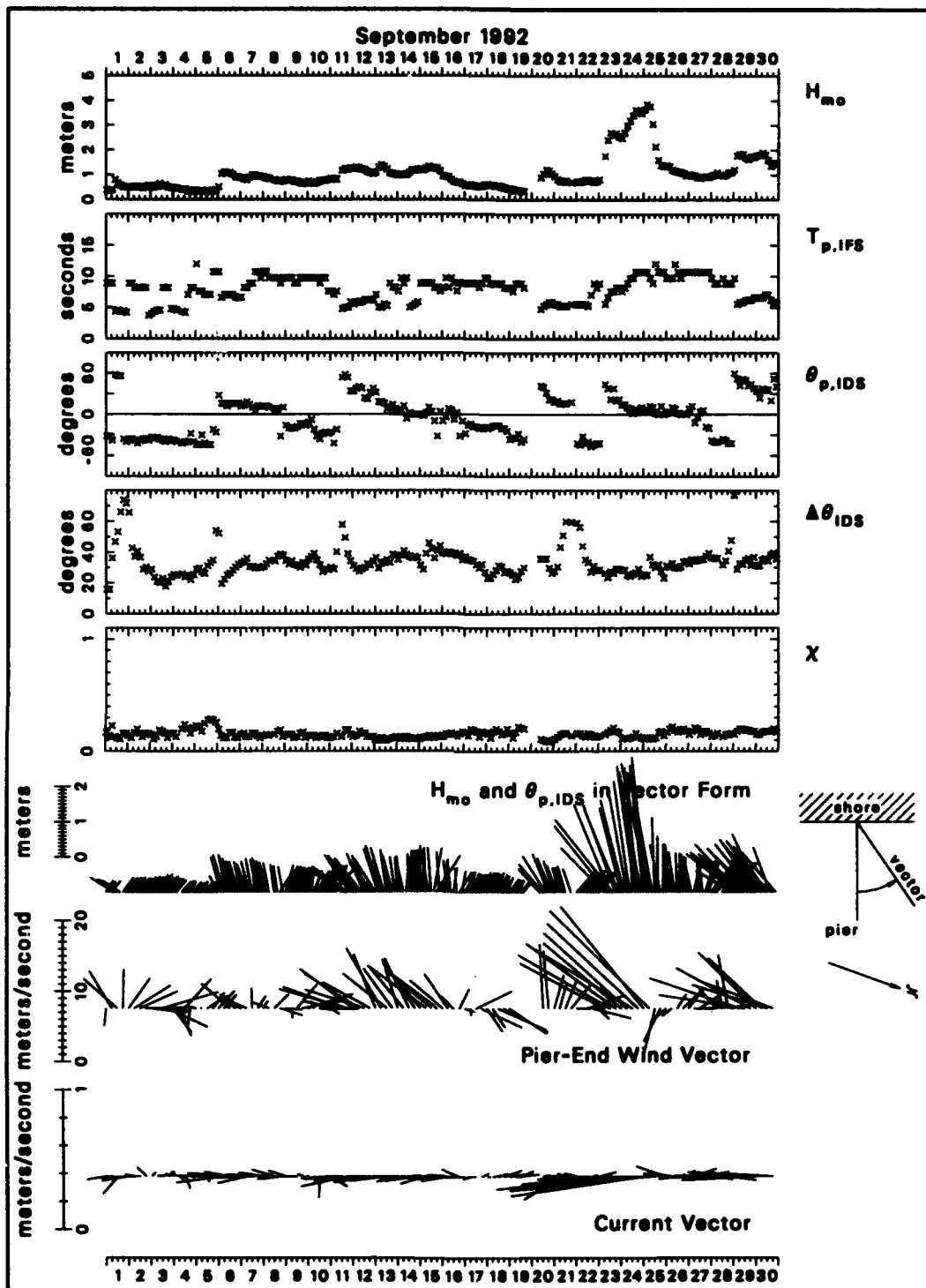


Figure B1. Bulk data for September 1992

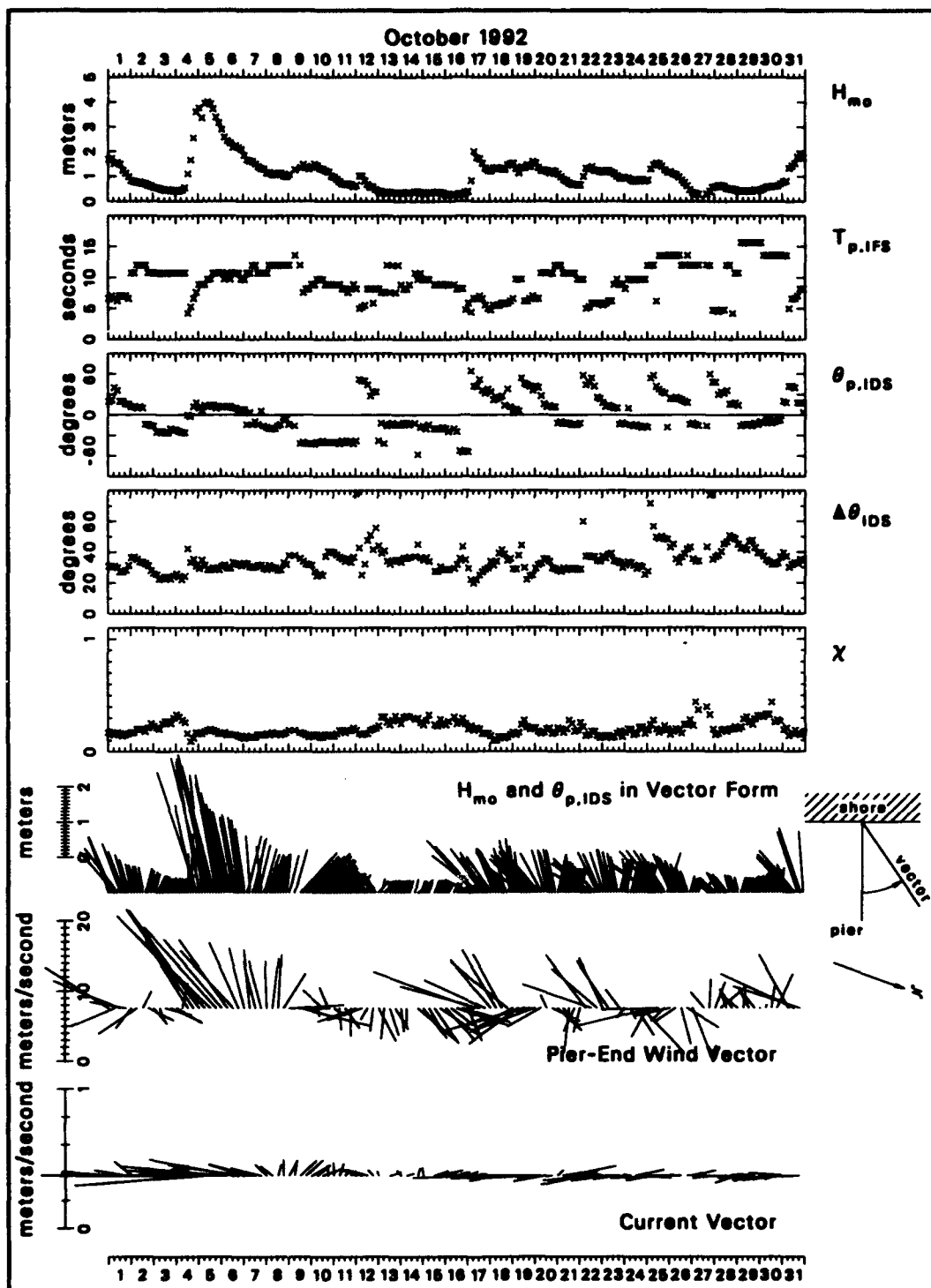


Figure B2. Bulk data for October 1992

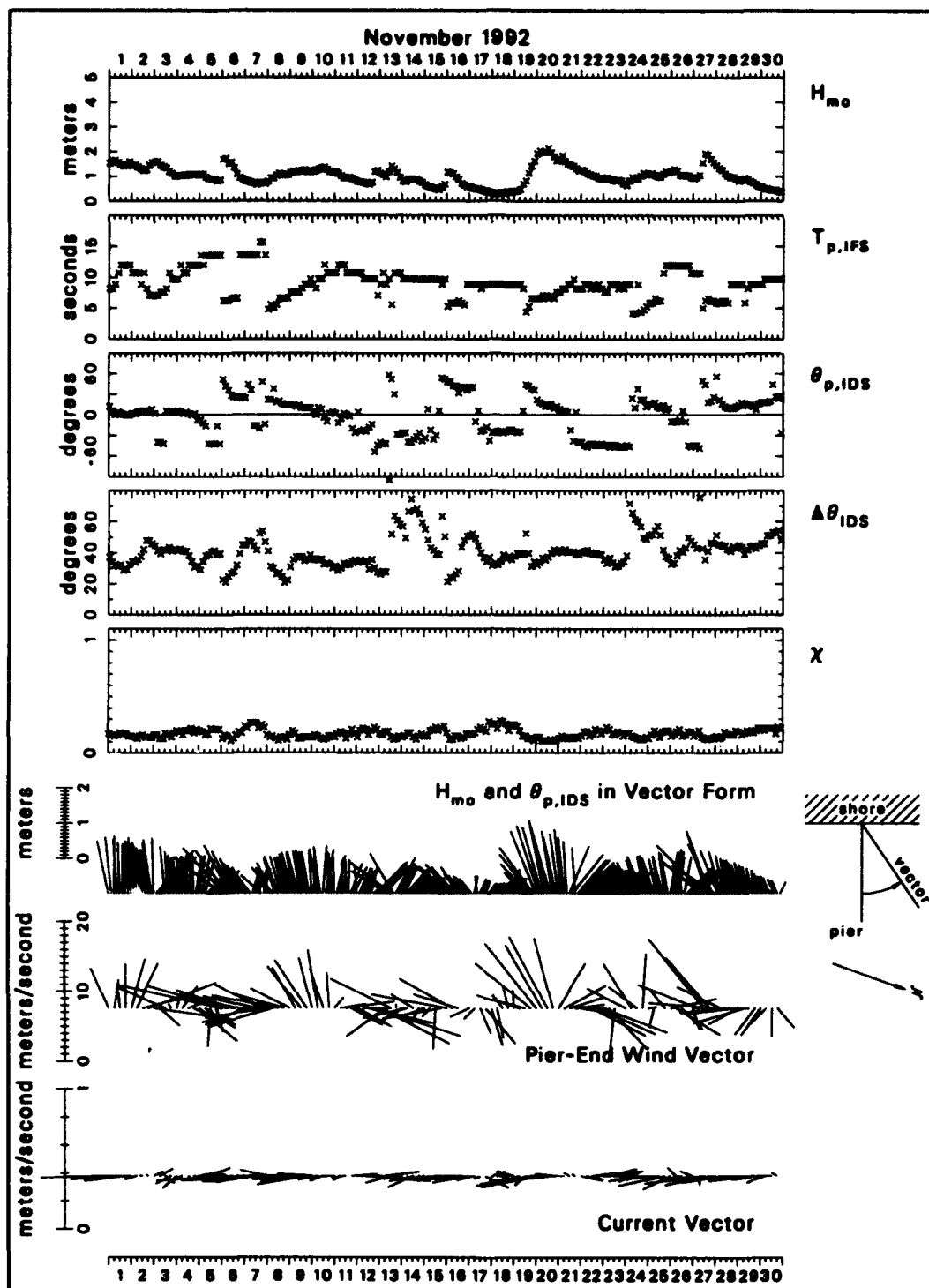


Figure B3. Bulk data for November 1992

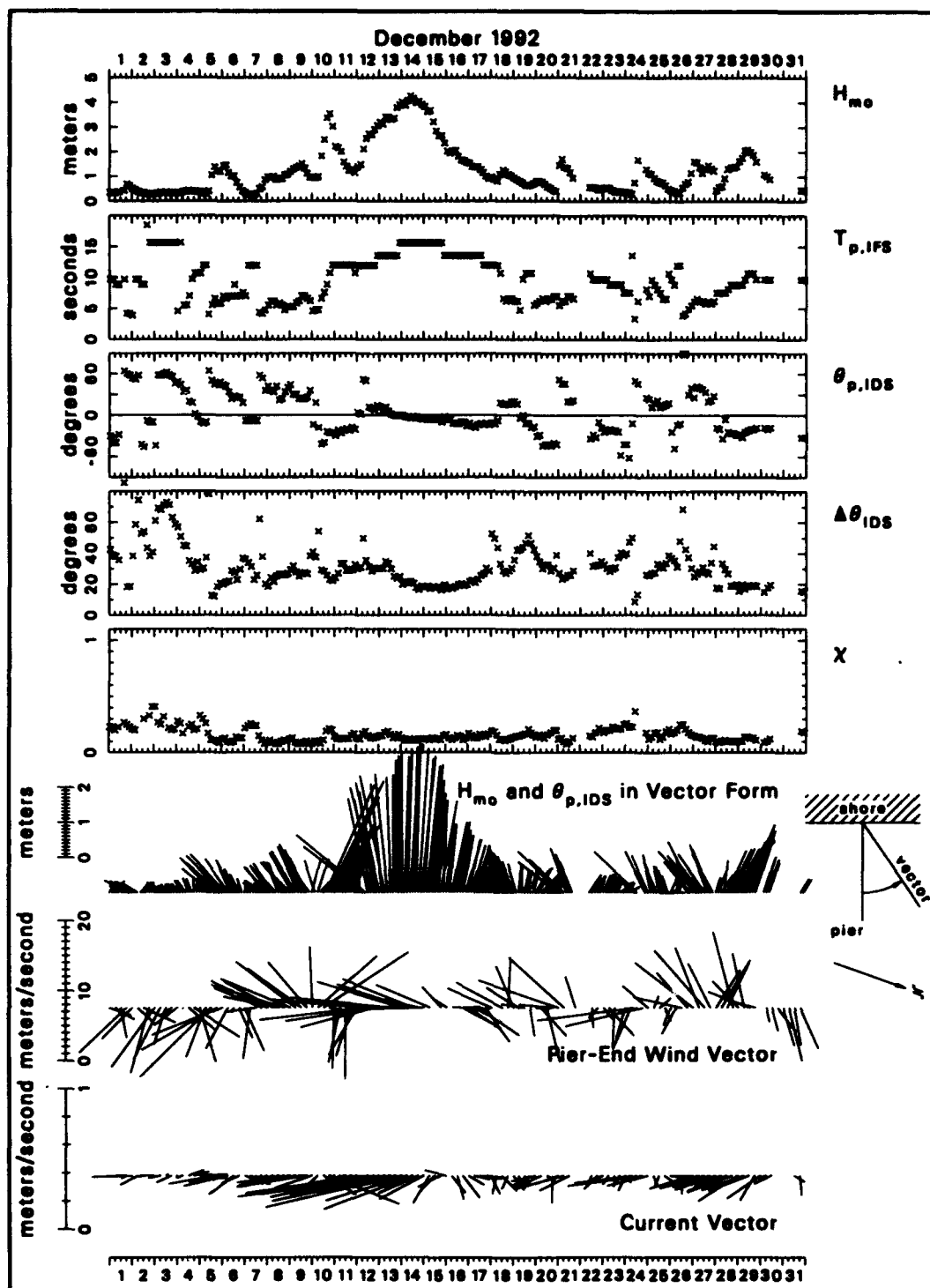


Figure B4. Bulk data for December 1992

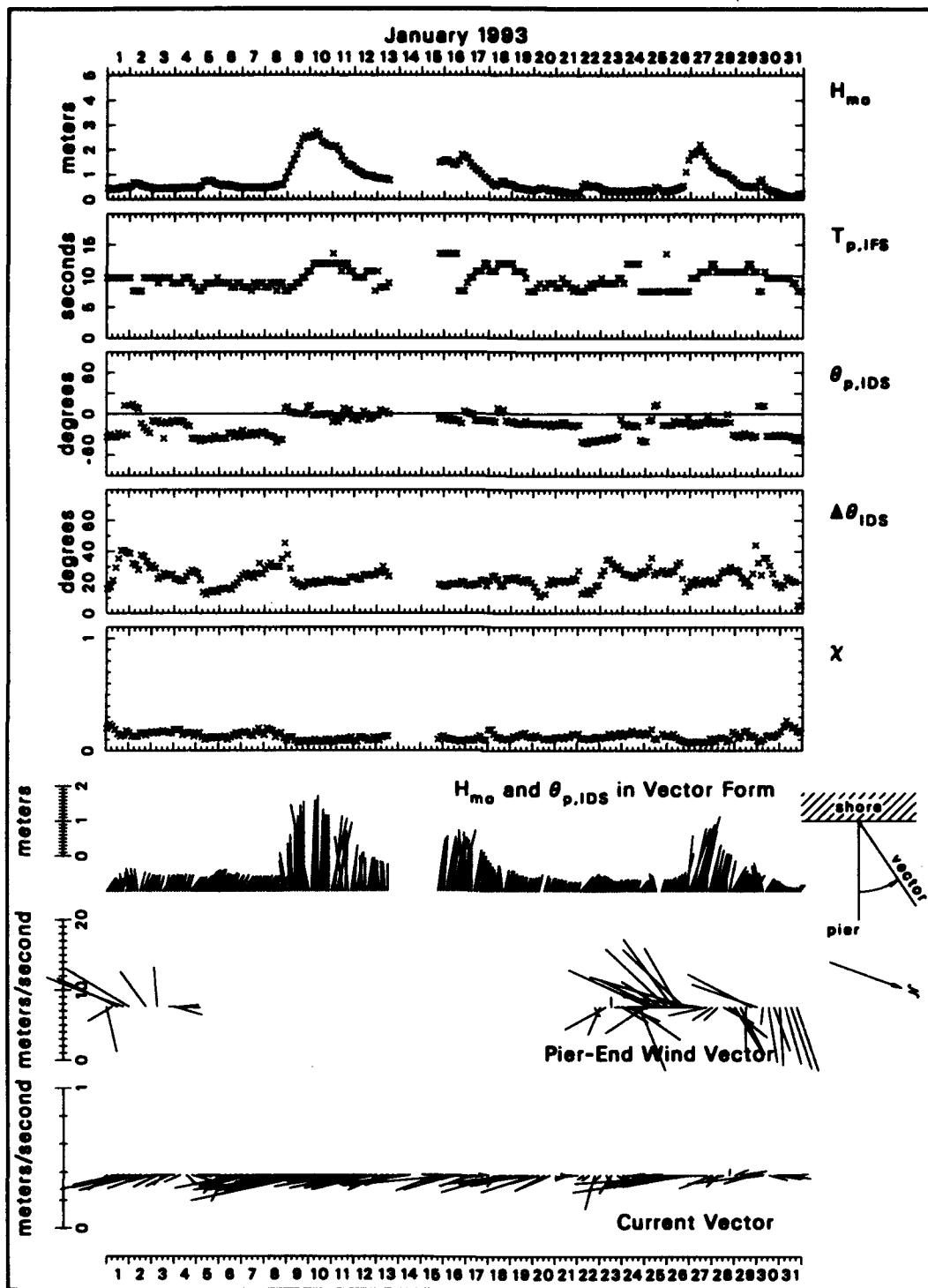


Figure B5. Bulk data for January 1993

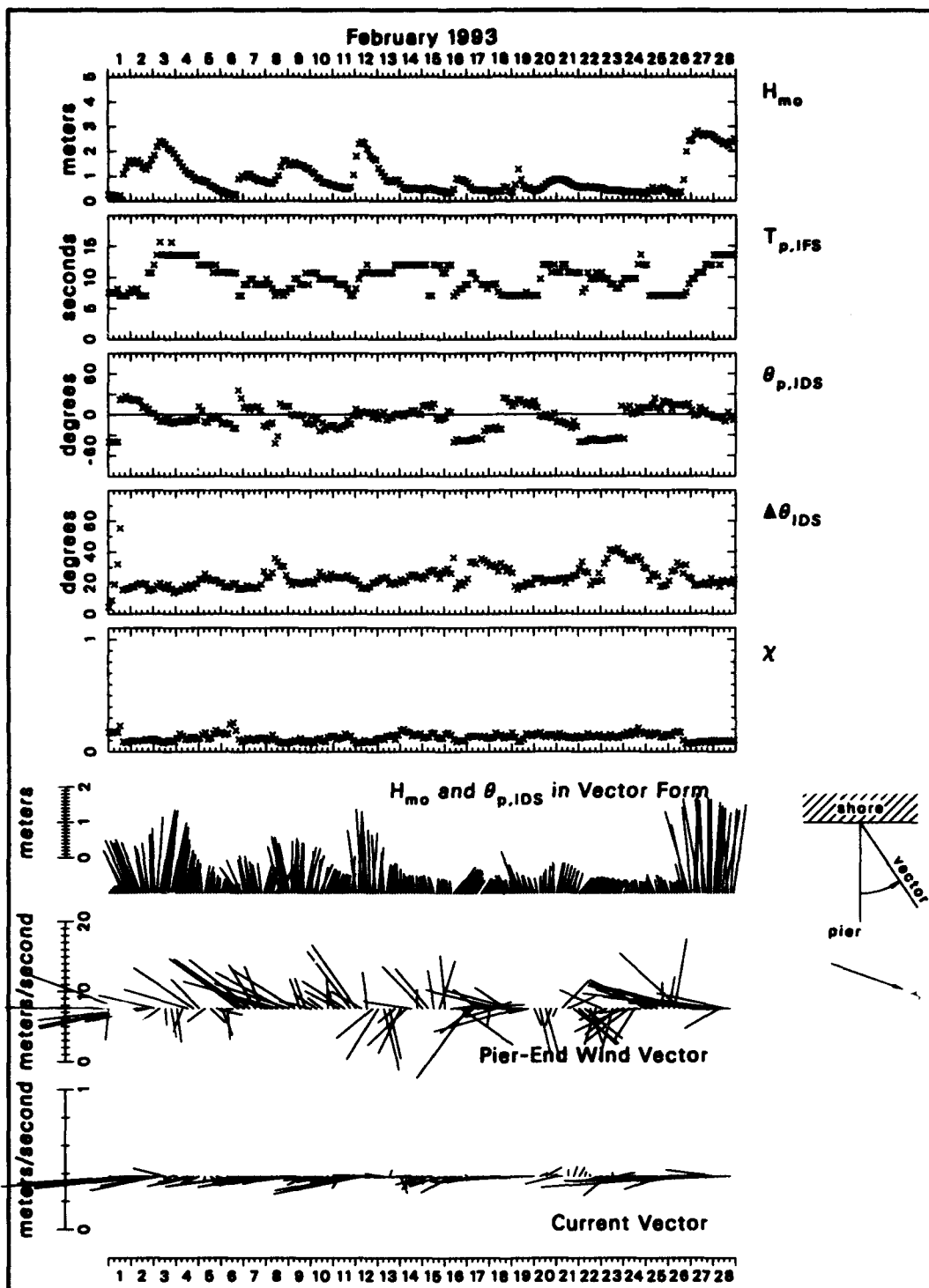


Figure B6. Bulk data for February 1993

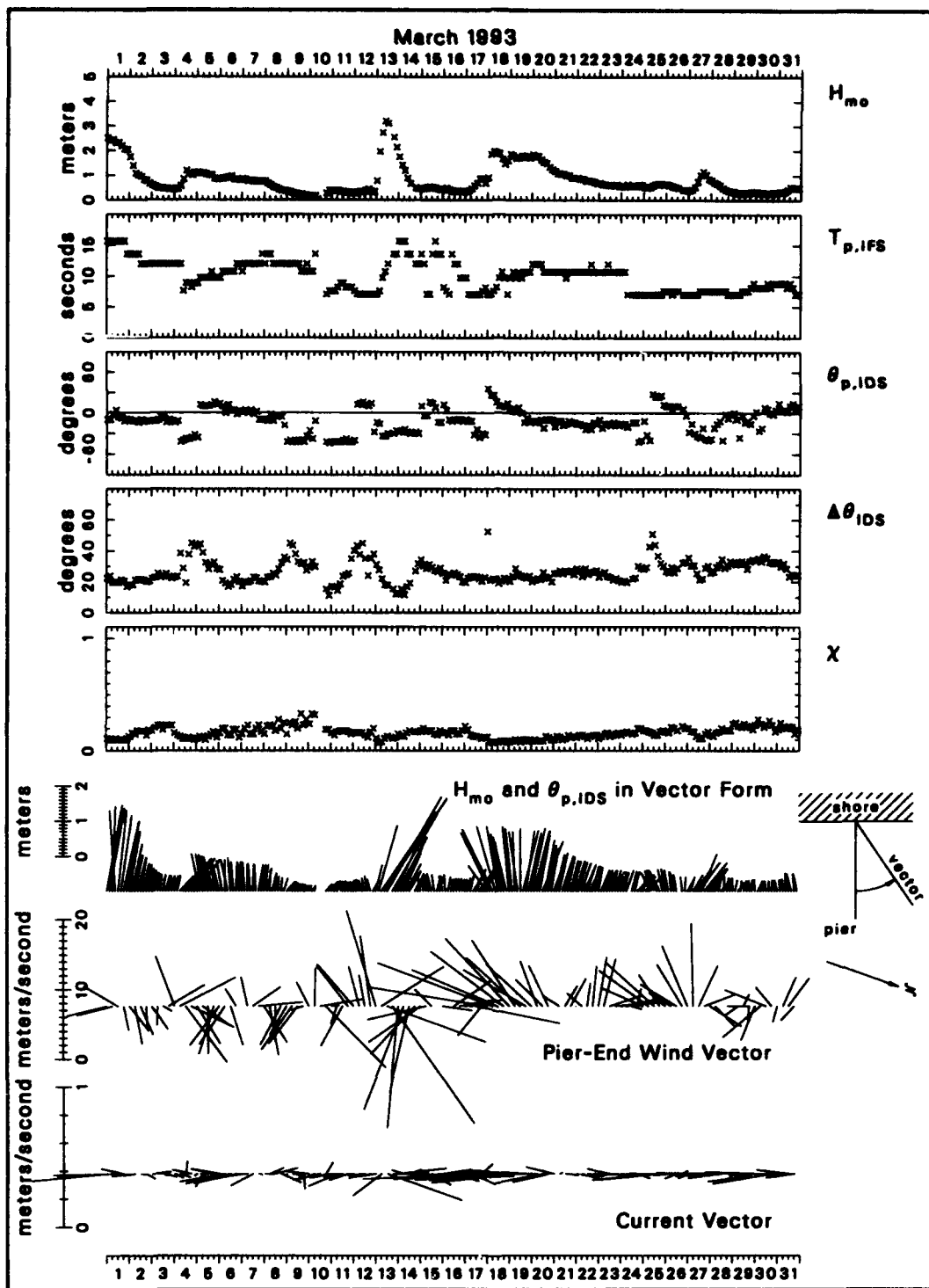


Figure B7. Bulk data for March 1993

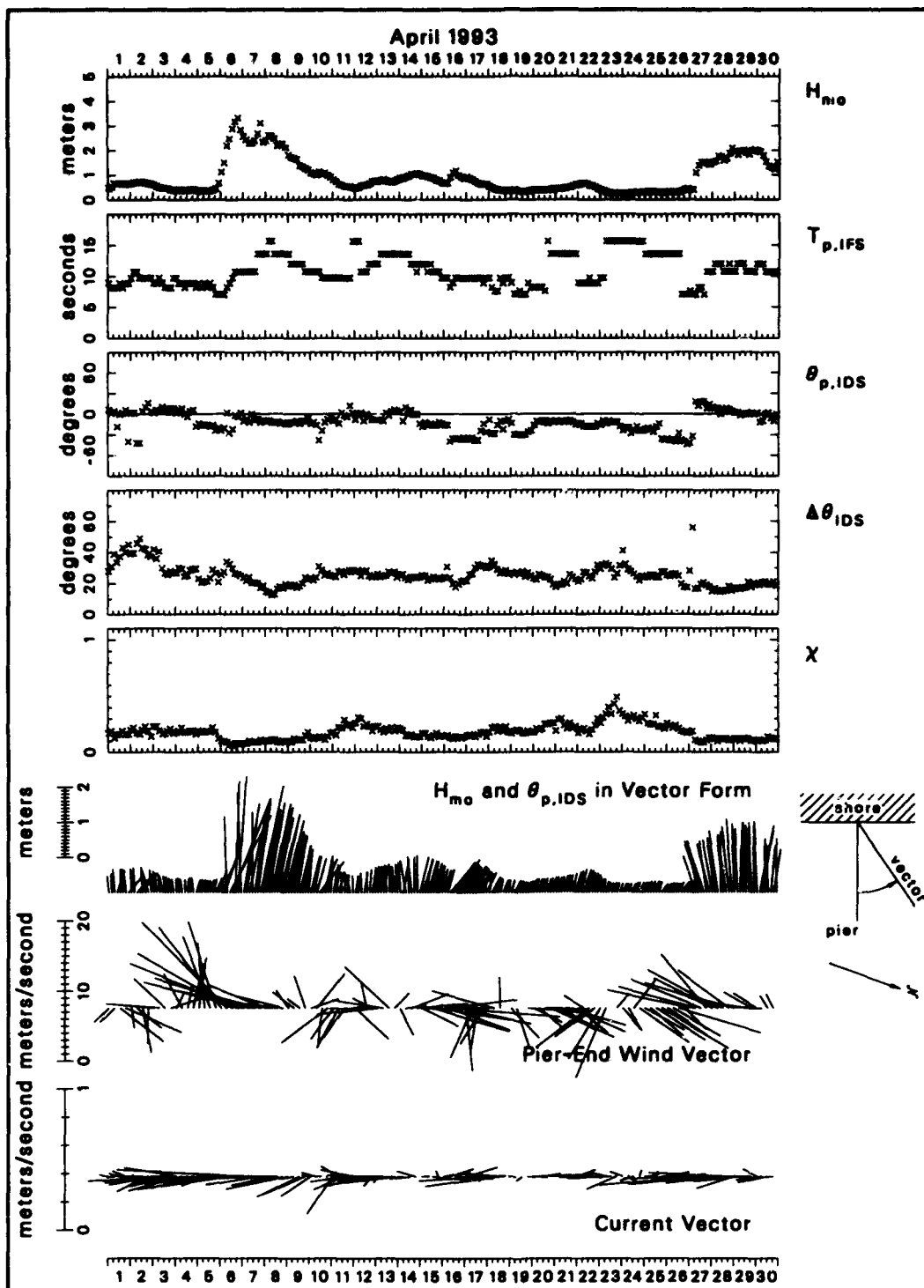


Figure B8. Bulk data for April 1993



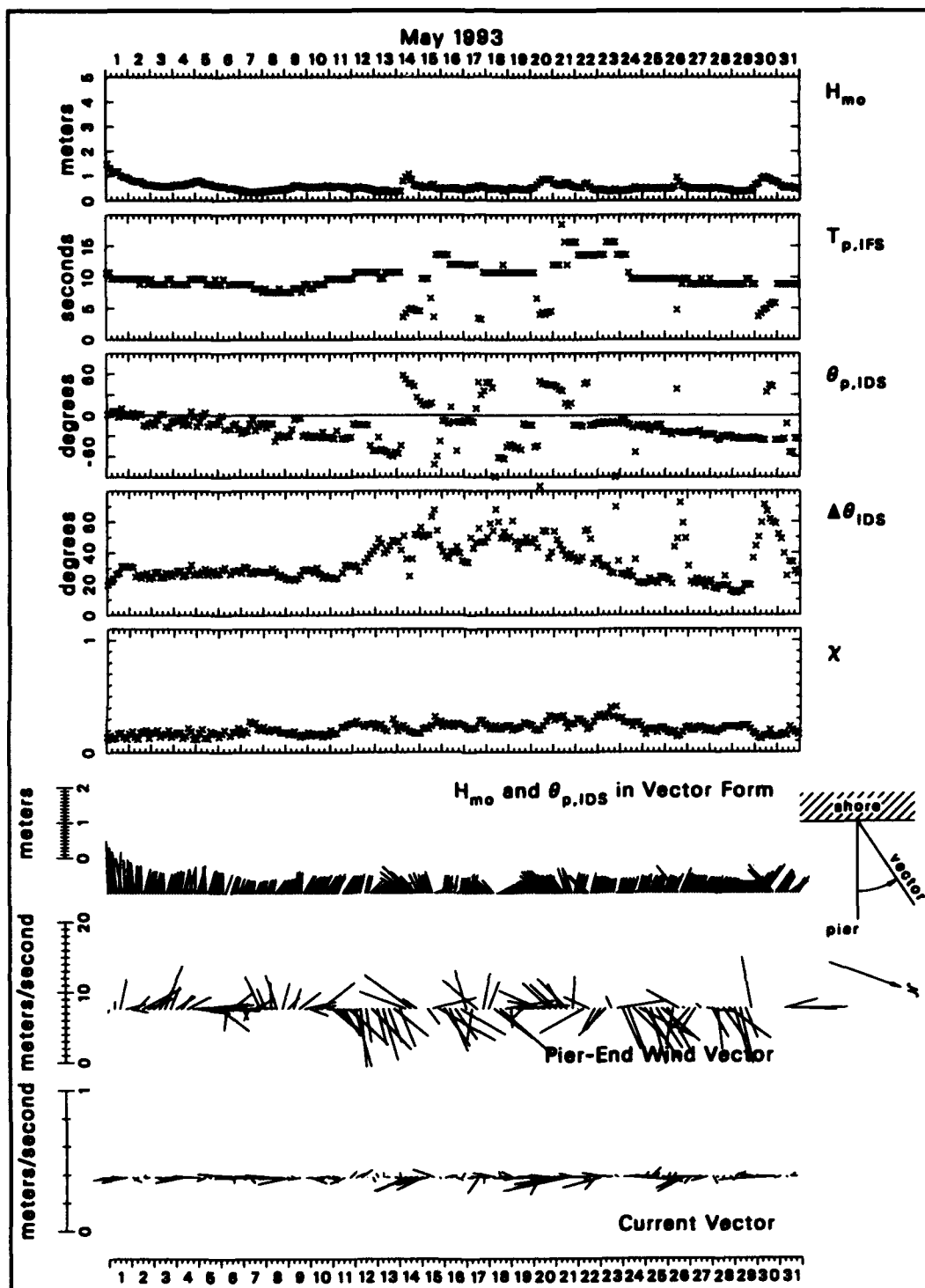


Figure B9. Bulk data for May 1993

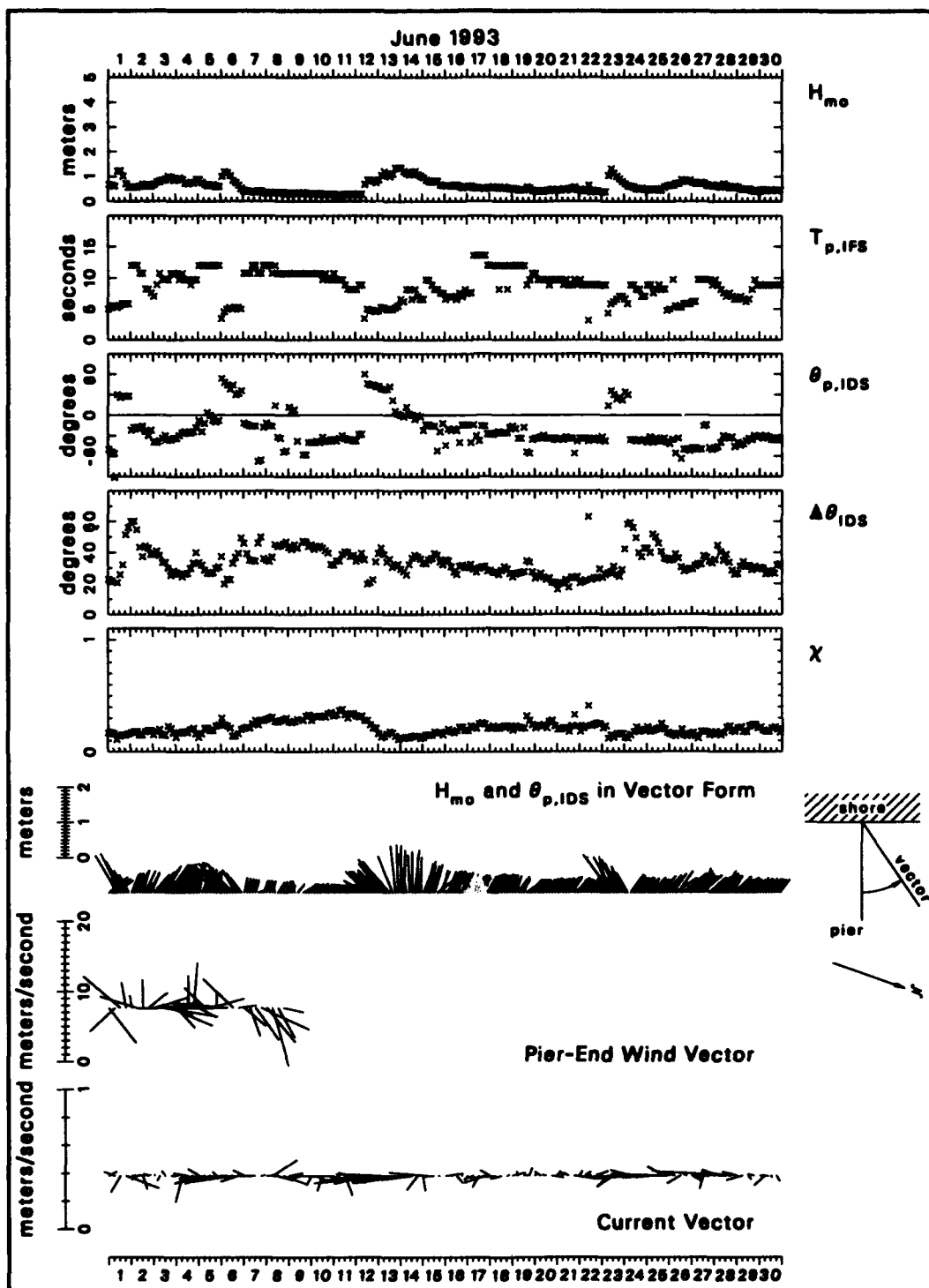


Figure B10. Bulk data for June 1993

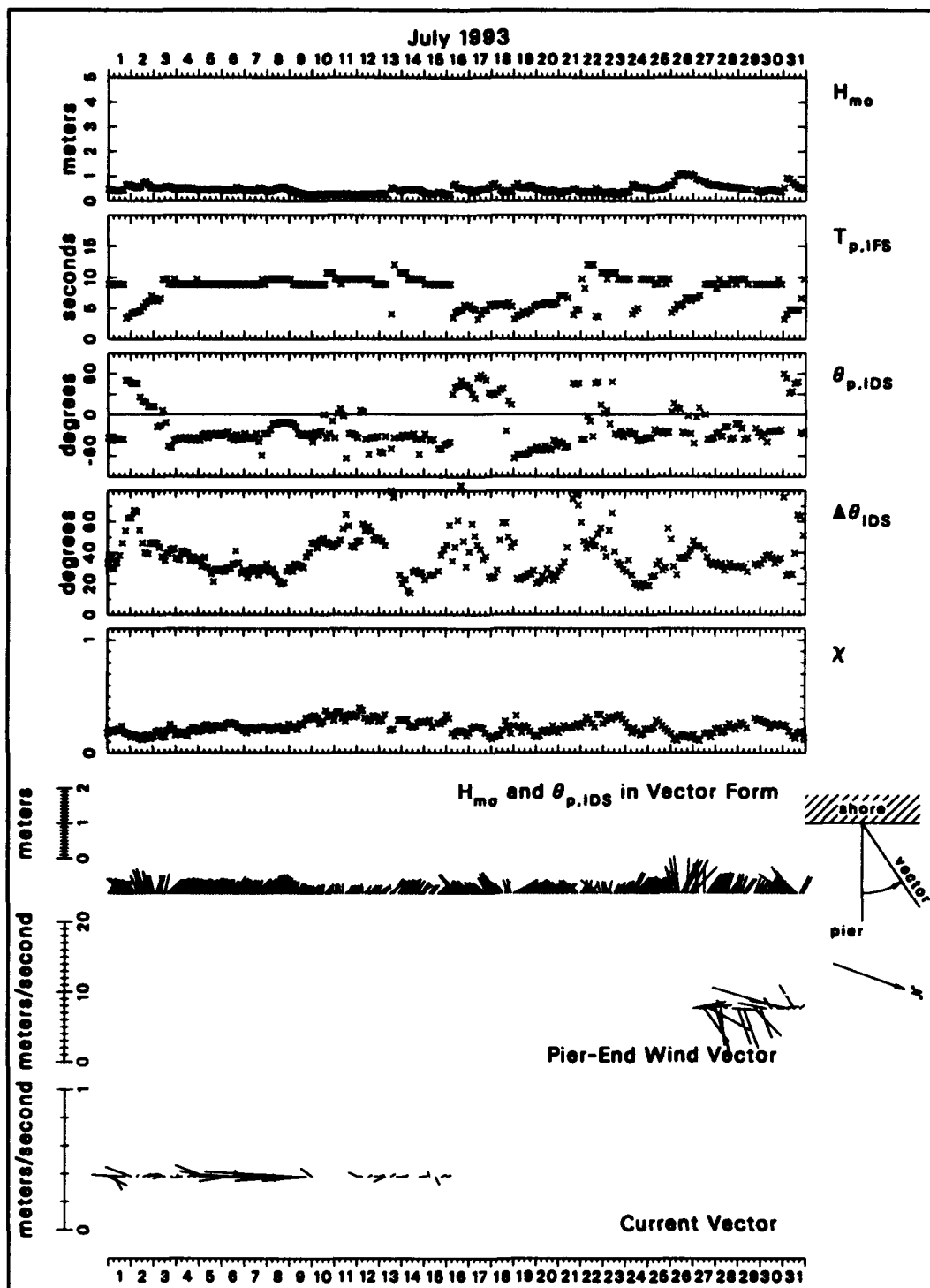


Figure B11. Bulk data for July 1993

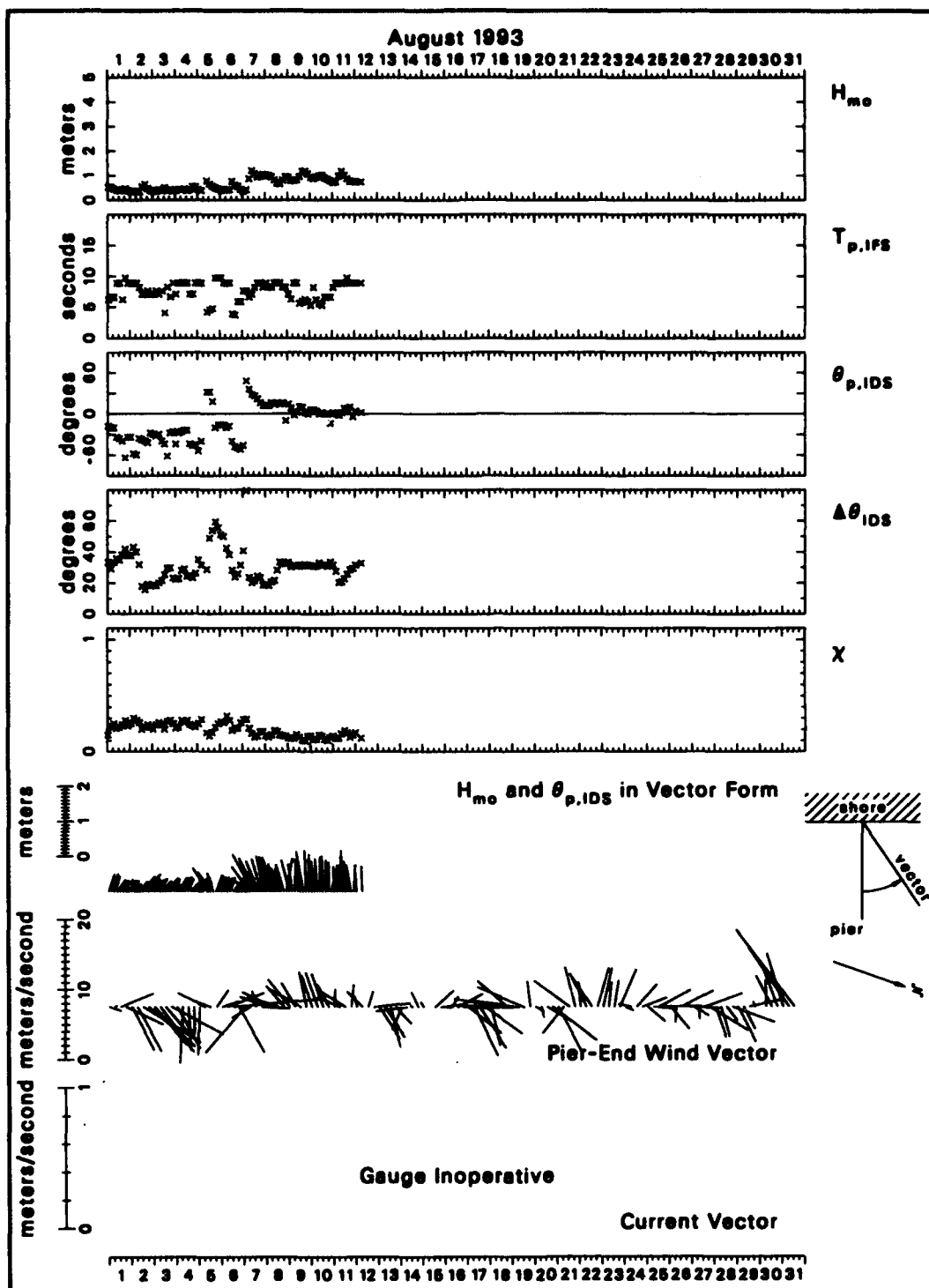


Figure B12. Bulk data for August 1993

# Appendix C

## Listing of FORTRAN Computer Program

---

```

      program readascii
c
c This program has the codes to read FRF 8-m
c array directional spectral ASCII output files.
c This program simply reads the ASCII file and
c writes an ASCII file as a test of the code.
c You will have to tune the I/O statements to
c your own system...
c
c Variable names, units and meanings are:
c
c=====
c
c      detetime...[character*10] Date and Eastern Standard Time of
c      beginning of data collection in the order year,
c      month, day, hour, minute and in the form
c      yyymmddhhmm (2-digit year, no blanks in any field)
c      hmo...[m] Energy-based characteristic wave height =
c      4*sigma, where sigma^2 is the variance of sea
c      surface displacement = volume under frequency-
c      direction (f-d) spectrum
c      fp...[Hz] Frequency at the peak of the frequency spectrum
c      thp...[deg] Direction at the peak of the directional
c      distribution at f=fp
c
c      ifimle...Algorithm flag: [1]=IMLE estimate, [0]=MLE estimate
c
c      istot...[sec] Length of time series processed
c      sfrq...[Hz] Data sampling frequency in time series
c
c      ifuindo...Windowing flag: [0]=data segments not windowed,
c      [1]=data segments windowed (Kaiser-Bessel window)
c      ifdtrnd...Detrending flag: [0]=data segments not detrended,
c      [1]=data segments detrended (linear trend removed)
c      nfft...Number of data points in a data segment
c      nensb...Number of half-lapped segments analyzed
c      nbend...Number of frequency bands averaged for frequency
c      smoothing
c      idgfr...Degrees of freedom of final frequency spectral
c      estimates
c
c      nofrq...Number of output frequency bands
c      delfs...[Hz] Width of an output frequency band
c      noang...Number of output direction bins (arcs)
c      odelang...[deg] Width of an output direction bin
c

```

Figure C1. Listing of FORTRAN Computer Program (Sheet 1 of 3)

```

c      dmin...[m] Minimum water depth during time series at
c      8-m array reference gage 'rname'
c      dbar...[m] Mean water depth during time series at
c      reference gage
c      dmax...[m] Maximum water depth during time series at
c      reference gage
c      rname...Reference gage ID (FRF gage name - get help if
c      you need to know which 8-m array gage it was)
c
c      s9b...[m/sec] Mean wind speed at pier end anemometer
c      (19.5 m above mean sea level) during time series
c      s9s...[m/sec] Standard deviation of wind speed at pier
c      end anemometer
c      s9m...[m/sec] Maximum wind speed at pier end anemometer
c      d9b...[deg] Vector averaged mean wind direction at pier
c      end anemometer - direction from which wind blows
c      in wave direction coordinates (degrees counter-
c      clockwise from shore normal)
c      d9s...[deg] Measure of variability of wind direction at pier
c      end anemometer = arctangent[(standard deviation of
c      cross-mean-streamline wind speed)/(mean wind speed)]
c
c      s6b... These are the same as s9b, s9s, s9m, d9b,
c      s6s... and d9s, except they are from the building
c      s6m... anemometer at the landward end of the
c      d6b... pier and 19.5 m above mean sea level
c      d6s...
c
c      oangle...[deg] Array of wave direction coordinates that
c      aligns with the f-d spectral array
c
c      nof...(Within a loop) Frequency index
c      of(nof)...[Hz] Frequency
c      osf(nof)...[m^2/Hz] Frequency spectral density at frequency
c      of(nof)
c      ogpet(nof)...[character*16] Encoded list of gages used to compute
c      directional distribution of energy at this frequency
c      itero(nof)...Number of IMLE iterations used to compute directional
c      distribution of energy at this frequency
c      oaspc(nof,noa)...[1/deg] Normalized frequency-direction spectral den-
c      sity at frequency of(nof) and direction oangle(noa).
c      Dimensional frequency-direction spectrum spc(nof,noa)
c      [in m^2/(Hz deg)] is found from:
c
c      spc(nof,noa) = osf(nof)*oaspc(nof,noa)
c
c=====
c
c links: none
c
c      character*4          rname
c      character*10         datetime
c      character*16         ogpet(29)
c      character*16         infile,          outfile
c      dimension            of(29),          osf(29),          itero(29)
c      dimension            oangle(181),     oaspc(29,181)
c
c ask user for input and output file names
c
c      write(*,'(2x,"Enter input file name.... "')')
c      read(*,'(a)') infile
c      write(*,'(2x,"Enter output file name.... "')')
c      read(*,'(a)') outfile
c
c open input file and read data
c
c      open(10,file=infile,status='unknown',access='sequential',
c      & form='formatted')
c
c      read(10,'(a10,f10.2,f10.5,f10.1,2i10,f10.2,i10)')
c      & datetime,      hmo,      fp,      thp,
c      & ifile,      istot,      sfrq,      ifwindo

```

Figure C1. (Sheet 2 of 3)

```

c
c      read(10,'(6i10,f10.5,i10)')
c      &      ifdtrnd,      nfft,      nensb,      nbend,
c      &      idgfr,      nofrq,      delfs,      noang
c
c      read(10,'(4f10.2,6x,a4,3f10.2)')
c      &      odelang,      dmin,      dbar,      dmax,
c      &      rname,      s9b,      s9s,      s9m
c
c      read(10,'(2f10.1,3f10.2,2f10.1)')
c      &      d9b,      d9s,      s6b,      s6s,
c      &      s6m,      d6b,      d6s
c
c      read(10,'(10f8.1)') (oangle(noa),noa=1,noang)
c
c      do 700 nof=1,nofrq
c
c          read(10,'(i10,f10.5,e20.7,4x,a16,i10)')
c          &      nof,      of(nof),      osf(nof),      ogpat(nof),
c          &      itero(nof)
c
c          read(10,'(8f10.7)') (ospc(nof,noa),noa=1,noang)
c
c 700      continue
c
c      close(10)
c
c      open output file and write variables just read
c
c      open(11,file=outfile,status='unknown',access='sequential',
c      &      form='formatted')
c
c      write(11,'(a10,f10.2,f10.5,f10.1,2i10,f10.2,i10)')
c      &      datetime,      hmo,      fp,      thp,
c      &      ifimle,      istot,      sfrq,      ifwindo
c
c      write(11,'(6i10,f10.5,i10)')
c      &      ifdtrnd,      nfft,      nensb,      nbend,
c      &      idgfr,      nofrq,      delfs,      noang
c
c      write(11,'(4f10.2,6x,a4,3f10.2)')
c      &      odelang,      dmin,      dbar,      dmax,
c      &      rname,      s9b,      s9s,      s9m
c
c      write(11,'(2f10.1,3f10.2,2f10.1)')
c      &      d9b,      d9s,      s6b,      s6s,
c      &      s6m,      d6b,      d6s
c
c      write(11,'(10f8.1)') (oangle(noa),noa=1,noang)
c
c      do 800 nof=1,nofrq
c
c          write(11,'(i10,f10.5,e20.7,4x,a16,i10)')
c          &      nof,      of(nof),      osf(nof),      ogpat(nof),
c          &      itero(nof)
c
c          write(11,'(8f10.7)') (ospc(nof,noa),noa=1,noang)
c
c 800      continue
c
c      close(11)
c
c      end

```

Figure C1. (Sheet 3 of 3)

# Appendix D

## Listing of Sample Data File

9210031300	0.45	0.09326	-34.0	1	8192	2.00	1
0	2048	15	10	160	29	0.00977	91
2.00	8.71	8.82	8.91	191	4.59	1.09	6.54
-77.4	17.3	4.17	1.16	6.30	-78.6	17.1	
-90.0	-88.0	-86.0	-84.0	-82.0	-80.0	-78.0	-76.0
-70.0	-68.0	-66.0	-64.0	-62.0	-60.0	-58.0	-56.0
-50.0	-48.0	-46.0	-44.0	-42.0	-40.0	-38.0	-36.0
-30.0	-28.0	-26.0	-24.0	-22.0	-20.0	-18.0	-16.0
-10.0	-8.0	-6.0	-4.0	-2.0	0.0	2.0	4.0
10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0
30.0	32.0	34.0	36.0	38.0	40.0	42.0	44.0
50.0	52.0	54.0	56.0	58.0	60.0	62.0	64.0
70.0	72.0	74.0	76.0	78.0	80.0	82.0	84.0
90.0							86.0
1	0.04443	0.4918004E-02	9871456	30			
0.0157139	0.0147816	0.0129323	0.0106885	0.0082321	0.0059344	0.0040530	0.0027600
0.0020220	0.0018408	0.0022139	0.0032995	0.0055416	0.0088115	0.0124697	0.0149968
0.0152114	0.0133999	0.0103782	0.0073888	0.0050008	0.0033809	0.0024064	0.0019045
0.0017251	0.0017927	0.0020703	0.0025472	0.0032138	0.0040186	0.0048990	0.0057158
0.0063757	0.0067978	0.0069672	0.0069597	0.0069939	0.0072919	0.0081961	0.0100511
0.0130295	0.0166282	0.0194301	0.0198344	0.0175030	0.0136403	0.0098314	0.0069864
0.0052400	0.0043700	0.0041123	0.0042766	0.0046741	0.0051535	0.0054996	0.0055393
0.0052019	0.0045472	0.0037039	0.0028688	0.0021669	0.0016653	0.0013604	0.0012299
0.0012447	0.0013867	0.0016480	0.0020002	0.0023974	0.0027625	0.0030042	0.0030446
0.0028482	0.0024423	0.0018967	0.0013406	0.0008723	0.0005432	0.0003526	0.0002650
0.0002566	0.0003268	0.0005064	0.0008610	0.0014558	0.0023156	0.0033603	0.0044414
0.0053636	0.0059462	0.0061055					
2	0.05420	0.1831319E-01	9871456	30			
0.0025521	0.0025028	0.0023771	0.0021871	0.0019449	0.0016693	0.0013828	0.0011120
0.0008817	0.0007106	0.0006109	0.0005939	0.0006811	0.0009163	0.0013633	0.0020605
0.0029445	0.0038209	0.0044345	0.0046242	0.0043839	0.0038429	0.0031761	0.0025364
0.0020192	0.0016622	0.0014740	0.0014576	0.0016359	0.0020695	0.0028632	0.0041519
0.0060567	0.0085943	0.0115922	0.0146707	0.0174065	0.0196488	0.0218528	0.0249838
0.0296213	0.0343021	0.0356235	0.0316262	0.0241765	0.0166293	0.0109628	0.0074454
0.0055834	0.0048507	0.0049232	0.0056422	0.0068607	0.0082785	0.0093443	0.0094513
0.0083719	0.0065092	0.0045767	0.0030785	0.0021173	0.0015721	0.0012910	0.0011665
0.0011317	0.0011457	0.0011811	0.0012165	0.0012356	0.0012250	0.0011759	0.0010846
0.0009548	0.0007972	0.0006295	0.0004725	0.0003435	0.0002520	0.0001990	0.0001821
0.0002032	0.0002748	0.0004243	0.0006894	0.0011008	0.0016558	0.0023030	0.0029525
0.0035008	0.0038599	0.0039770					
3	0.06396	0.2241828E-01	98712456	27			
0.0022133	0.0020690	0.0018274	0.0015398	0.0012318	0.0009345	0.0006810	0.0004825
0.0003488	0.0002770	0.0002617	0.0003050	0.0004326	0.0006929	0.0011281	0.0017392
0.0024774	0.0031969	0.0037161	0.0039904	0.0039765	0.0038470	0.0036929	0.0037303
0.0042172	0.0056271	0.0080586	0.0119911	0.0159642	0.0180978	0.0173641	0.0144669
0.0112285	0.0091126	0.0083330	0.0093656	0.0123070	0.0176685	0.0244817	0.0302014
0.0310932	0.0269077	0.0211598	0.0169314	0.0148036	0.0139005	0.0131491	0.0118526
0.0099143	0.0077108	0.0057287	0.0042515	0.0033699	0.0029983	0.0030369	0.0033891
0.0039114	0.0043897	0.0045280	0.0041724	0.0034085	0.0024986	0.0017388	0.0012202

Figure D1. Listing of sample data file (Sheet 1 of 6)



0.0009248	0.0007852	0.0007433	0.0007631	0.0008164	0.0008777	0.0009243	0.0009418
0.0009115	0.0008300	0.0007034	0.0005511	0.0003978	0.0002688	0.0001786	0.0001277
0.0001105	0.0001263	0.0001852	0.0003143	0.0005486	0.0008986	0.0013368	0.0017910
0.0021619	0.0023766	0.0024119					
4	0.07373	0.5731334E-01	98712456	30			
0.0011504	0.0011038	0.0010077	0.0008791	0.0007313	0.0005792	0.0004379	0.0003189
0.0002287	0.0001682	0.0001347	0.0001260	0.0001445	0.0002036	0.0003316	0.0005725
0.0009669	0.0015143	0.0021433	0.0027229	0.0031164	0.0032561	0.0031745	0.0029941
0.0028818	0.0030267	0.0036387	0.0050649	0.0076436	0.0114169	0.0154435	0.0180468
0.0181952	0.0167025	0.0153697	0.0157616	0.0188573	0.0246876	0.0309547	0.0334057
0.0298951	0.0231621	0.0172983	0.0140857	0.0133032	0.0140645	0.0151936	0.0153957
0.0139368	0.0112391	0.0084432	0.0064042	0.0053220	0.0049825	0.0050484	0.0051273
0.0048719	0.0041556	0.0031491	0.0021661	0.0014194	0.0009431	0.0006747	0.0005367
0.0004750	0.0004569	0.0004619	0.0004759	0.0004882	0.0004895	0.0004733	0.0004365
0.0003806	0.0003109	0.0002371	0.0001696	0.0001162	0.0000799	0.0000595	0.0000523
0.0000574	0.0000776	0.0001207	0.0001981	0.0003188	0.0004819	0.0006721	0.0008614
0.0010170	0.0011112	0.0011333					
5	0.08350	0.1936829E+00	712456	10			
0.0001742	0.0001749	0.0001767	0.0001798	0.0001841	0.0001898	0.0001970	0.0002060
0.0002170	0.0002305	0.0002471	0.0002676	0.0002931	0.0003255	0.0003676	0.0004237
0.0005008	0.0006099	0.0007692	0.0010078	0.0013713	0.0019285	0.0027751	0.0040303
0.0058173	0.0082250	0.0112564	0.0147821	0.0185331	0.0221437	0.0252669	0.0276869
0.0293683	0.0303530	0.0306588	0.0302083	0.0288954	0.0266818	0.0236963	0.0202484
0.0167496	0.0135612	0.0108924	0.0087928	0.0072103	0.0060535	0.0052313	0.0046692
0.0043118	0.0041194	0.0040596	0.0040966	0.0041776	0.0042256	0.0041537	0.0039057
0.0034913	0.0029790	0.0024524	0.0019723	0.0015666	0.0012386	0.0009797	0.0007776
0.0006207	0.0004995	0.0004065	0.0003366	0.0002855	0.0002502	0.0002280	0.0002168
0.0002143	0.0002184	0.0002271	0.0002382	0.0002500	0.0002610	0.0002703	0.0002774
0.0002823	0.0002852	0.0002865	0.0002866	0.0002859	0.0002847	0.0002832	0.0002818
0.0002806	0.0002797	0.0002791					
6	0.09326	0.2709621E+00	7123456	17			
0.0002978	0.0002788	0.0002548	0.0002319	0.0002100	0.0001889	0.0001684	0.0001489
0.0001305	0.0001135	0.0000986	0.0000861	0.0000769	0.0000714	0.0000708	0.0000777
0.0000961	0.0001345	0.0002142	0.0003768	0.0007096	0.0013796	0.0027140	0.0052287
0.0095766	0.0163351	0.0247751	0.0314531	0.0341990	0.0325962	0.0295363	0.0266521
0.0240263	0.0218681	0.0203824	0.0195596	0.0195597	0.0199974	0.0203607	0.0194635
0.0168109	0.0131257	0.0095019	0.0066647	0.0047521	0.0035980	0.0029932	0.0027878
0.0029058	0.0033201	0.0040003	0.0048412	0.0055527	0.0057372	0.0051606	0.0040459
0.0028841	0.0020053	0.0014637	0.0011643	0.0010171	0.0009540	0.0009334	0.0009304
0.0009213	0.0008930	0.0008355	0.0007488	0.0006339	0.0005054	0.0003810	0.0002742
0.0001938	0.0001397	0.0001089	0.0000949	0.0000940	0.0001040	0.0001233	0.0001499
0.0001821	0.0002166	0.0002512	0.0002826	0.0003093	0.0003293	0.0003417	0.0003465
0.0003443	0.0003355	0.0003253					
7	0.10303	0.1595650E+00	7123456	16			
0.0002953	0.0002828	0.0002660	0.0002487	0.0002309	0.0002125	0.0001937	0.0001749
0.0001563	0.0001387	0.0001225	0.0001087	0.0000981	0.0000918	0.0000909	0.0000981
0.0001179	0.0001591	0.0002412	0.0004013	0.0007120	0.0013042	0.0023992	0.0043015
0.0073256	0.0115133	0.0162904	0.0203787	0.0229255	0.0241615	0.0251785	0.0262795
0.0274390	0.0281895	0.0283883	0.0280440	0.0275267	0.0267933	0.0254736	0.0230799
0.0195232	0.0154334	0.0116481	0.0087076	0.0067116	0.0055004	0.0048492	0.0045561
0.0044500	0.0043762	0.0041970	0.0038246	0.0032580	0.0025926	0.0019594	0.0014576
0.0011126	0.0009043	0.0007958	0.0007536	0.0007533	0.0007753	0.0008035	0.0008242
0.0008243	0.0007964	0.0007370	0.0006503	0.0005446	0.0004340	0.0003315	0.0002465
0.0001835	0.0001416	0.0001174	0.0001071	0.0001081	0.0001185	0.0001372	0.0001628
0.0001938	0.0002276	0.0002621	0.0002948	0.0003236	0.0003471	0.0003642	0.0003742
0.0003774	0.0003736	0.0003666					
8	0.11279	0.1134366E+00	7123456	28			
0.0007390	0.0006933	0.0006273	0.0005563	0.0004822	0.0004078	0.0003357	0.0002690
0.0002100	0.0001605	0.0001215	0.0000928	0.0000736	0.0000632	0.0000614	0.0000701
0.0000965	0.0001585	0.0003015	0.0006297	0.0013704	0.0029517	0.0059758	0.0108307
0.0166216	0.0207408	0.0212618	0.0193899	0.0179775	0.0186051	0.0216599	0.0263526
0.0310367	0.0328849	0.0306395	0.0257360	0.0207982	0.0170439	0.0145027	0.0128269
0.0117258	0.0110766	0.0108816	0.0112203	0.0120470	0.0128785	0.0127840	0.0111415
0.0083675	0.0054998	0.0032896	0.0018950	0.0011255	0.0007365	0.0005538	0.0004808
0.0004679	0.0004885	0.0005245	0.0005612	0.0005867	0.0005920	0.0005726	0.0005296
0.0004675	0.0003940	0.0003174	0.0002447	0.0001811	0.0001294	0.0000903	0.0000625
0.0000441	0.0000327	0.0000266	0.0000243	0.0000254	0.0000300	0.0000390	0.0000536
0.0000754	0.0001054	0.0001438	0.0001890	0.0002382	0.0002874	0.0003322	0.0003683
0.0003925	0.0004023	0.0004002					
9	0.12256	0.6367844E-01	7123456	27			
0.0005367	0.0005145	0.0004813	0.0004439	0.0004034	0.0003607	0.0003173	0.0002746
0.0002343	0.0001979	0.0001668	0.0001423	0.0001252	0.0001172	0.0001204	0.0001409

Figure D1. (Sheet 2 of 6)

0.0001920	0.0003043	0.0005466	0.0010539	0.0020490	0.0037729	0.0062683	0.0090996
0.0114611	0.0128523	0.0136180	0.0147201	0.0173926	0.0223114	0.0286696	0.0330104
0.0321631	0.0270529	0.0215570	0.0180004	0.0167267	0.0172921	0.0189745	0.0206887
0.0210763	0.0194560	0.0166130	0.0139752	0.0122418	0.0112025	0.0102735	0.0089620
0.0071579	0.0051716	0.0034518	0.0022453	0.0015252	0.0011435	0.0009626	0.0008922
0.0008763	0.0008788	0.0008747	0.0008490	0.0007960	0.0007177	0.0006214	0.0005166
0.0004123	0.0003158	0.0002323	0.0001646	0.0001130	0.0000761	0.0000514	0.0000359
0.0000267	0.0000219	0.0000202	0.0000210	0.0000242	0.0000300	0.0000388	0.0000511
0.0000670	0.0000863	0.0001084	0.0001322	0.0001563	0.0001793	0.0001995	0.0002157
0.0002267	0.0002319	0.0002320					
10	0.13232	0.5777463E-01	7123456			30	
0.0003647	0.0003562	0.0003423	0.0003253	0.0003058	0.0002841	0.0002609	0.0002369
0.0002131	0.0001902	0.0001693	0.0001514	0.0001373	0.0001284	0.0001262	0.0001334
0.0001553	0.0002022	0.0002960	0.0004822	0.0008508	0.0015696	0.0029095	0.0052064
0.0086688	0.0130338	0.0173721	0.0205305	0.0221335	0.0226467	0.0226625	0.0223451
0.0216225	0.0206406	0.0198731	0.0198713	0.0211495	0.0239478	0.0277357	0.0303414
0.0288190	0.0230791	0.0165237	0.0118447	0.0093488	0.0083883	0.0082998	0.0084240
0.0080160	0.0066226	0.0046171	0.0028302	0.0016820	0.0010814	0.0008097	0.0007179
0.0007298	0.0008021	0.0008930	0.0009528	0.0009379	0.0008356	0.0006715	0.0004905
0.0003303	0.0002083	0.0001252	0.0000733	0.0000427	0.0000255	0.0000162	0.0000114
0.0000091	0.0000085	0.0000091	0.0000111	0.0000147	0.0000205	0.0000293	0.0000416
0.0000580	0.0000786	0.0001028	0.0001298	0.0001580	0.0001857	0.0002110	0.0002321
0.0002475	0.0002560	0.0002577					
11	0.14209	0.5459952E-01	123456			9	
0.0003094	0.0003102	0.0003129	0.0003176	0.0003246	0.0003340	0.0003463	0.0003619
0.0003815	0.0004064	0.0004381	0.0004793	0.0005340	0.0006088	0.0007146	0.0008696
0.0011042	0.0014675	0.0020341	0.0029020	0.0041654	0.0058491	0.0078243	0.0097919
0.0114012	0.0124423	0.0129431	0.0131146	0.0132388	0.0135789	0.0143388	0.0156236
0.0173981	0.0194590	0.0214746	0.0231033	0.0241343	0.0245501	0.0244865	0.0241165
0.0235182	0.0225876	0.0210942	0.0189006	0.0161523	0.0132235	0.0104939	0.0081921
0.0063820	0.0050240	0.0040341	0.0033203	0.0027982	0.0023988	0.0020714	0.0017839
0.0015210	0.0012785	0.0010582	0.0008632	0.0006951	0.0005536	0.0004370	0.0003425
0.0002671	0.0002079	0.0001623	0.0001278	0.0001025	0.0000847	0.0000730	0.0000663
0.0000637	0.0000648	0.0000691	0.0000762	0.0000859	0.0000976	0.0001110	0.0001254
0.0001401	0.0001547	0.0001687	0.0001816	0.0001932	0.0002033	0.0002117	0.0002182
0.0002229	0.0002258	0.0002267					
12	0.15186	0.4887935E-01	123456			5	
0.0003486	0.0003505	0.0003553	0.0003628	0.0003733	0.0003872	0.0004051	0.0004276
0.0004559	0.0004913	0.0005360	0.0005930	0.0006668	0.0007642	0.0008959	0.010787
0.0013397	0.0017214	0.0022903	0.0031443	0.0044160	0.0062564	0.0087799	0.0119550
0.0154819	0.0187956	0.0213088	0.0227429	0.0232225	0.0230836	0.0226306	0.0220205
0.0212829	0.0204078	0.0194187	0.0183904	0.0174251	0.0166197	0.0160429	0.0157191
0.0156081	0.0155801	0.0154076	0.0148204	0.0136385	0.0119017	0.0098640	0.0078440
0.0060719	0.0046413	0.0035448	0.0027272	0.0021236	0.0016771	0.0013435	0.0010910
0.0008972	0.0007464	0.0006276	0.0005328	0.0004563	0.0003939	0.0003424	0.0002996
0.0002637	0.0002336	0.0002084	0.0001877	0.0001712	0.0001589	0.0001506	0.0001462
0.0001453	0.0001474	0.0001518	0.0001579	0.0001649	0.0001721	0.0001790	0.0001853
0.0001909	0.0001956	0.0001995	0.0002027	0.0002052	0.0002071	0.0002086	0.0002098
0.0002106	0.0002113	0.0002117					
13	0.16162	0.3320779E-01	123456			8	
0.0003719	0.0003736	0.0003772	0.0003824	0.0003895	0.0003987	0.0004103	0.0004249
0.0004431	0.0004661	0.0004951	0.0005324	0.0005811	0.0006463	0.0007354	0.0008609
0.0010425	0.0013127	0.0017241	0.0023616	0.0033553	0.0048907	0.0071943	0.0104656
0.0147229	0.0196000	0.0242662	0.0276991	0.0292393	0.0289386	0.0273730	0.0251944
0.0228586	0.0206166	0.0186034	0.0168999	0.0155568	0.0146005	0.0140331	0.0138214
0.0138687	0.0139806	0.0138667	0.0132371	0.0119746	0.0102304	0.0083257	0.0065582
0.0050898	0.0039523	0.0031046	0.0024823	0.0020242	0.0016814	0.0014186	0.0012114
0.0010437	0.0009048	0.0007877	0.0006876	0.0006013	0.0005262	0.0004607	0.0004035
0.0003535	0.0003105	0.0002740	0.0002440	0.0002207	0.0002040	0.0001938	0.0001900
0.0001921	0.0001995	0.0002110	0.0002257	0.0002423	0.0002596	0.0002765	0.0002923
0.0003066	0.0003189	0.0003294	0.0003382	0.0003453	0.0003510	0.0003556	0.0003592
0.0003620	0.0003642	0.0003654					
14	0.17139	0.3075654E-01	123456			30	
0.0003890	0.0003888	0.0003892	0.0003905	0.0003928	0.0003965	0.0004021	0.0004100
0.0004212	0.0004370	0.0004590	0.0004900	0.0005340	0.0005977	0.0006915	0.0008334
0.0010544	0.0014100	0.0020009	0.0030091	0.0047490	0.0077025	0.0124146	0.0190203
0.0264030	0.0319816	0.0334151	0.0307972	0.0262734	0.0218867	0.0185421	0.0163290
0.0150561	0.0145233	0.0145875	0.0151385	0.0160292	0.0169840	0.0175508	0.0172254
0.0158045	0.0135678	0.0111149	0.0089453	0.0072774	0.0061140	0.0053627	0.0049080
0.0046297	0.0044043	0.0041175	0.0037004	0.0031597	0.0025645	0.0019978	0.0015150
0.0011343	0.0008485	0.0006399	0.0004896	0.0003817	0.0003043	0.0002487	0.0002090
0.0001810	0.0001618	0.0001497	0.0001430	0.0001409	0.0001424	0.0001467	0.0001530
0.0001604	0.0001683	0.0001762	0.0001836	0.0001903	0.0001962	0.0002014	0.0002058

Figure D1. (Sheet 3 of 6)

0.0002097	0.0002129	0.0002157	0.0002181	0.0002200	0.0002215	0.0002226	0.0002233
0.0002235	0.0002234	0.0002230					
15	0.18115	0.2099873E-01	123456			9	
0.0003724	0.0003741	0.0003783	0.0003852	0.0003952	0.0004090	0.0004276	0.0004526
0.0004860	0.0005313	0.0005935	0.0006804	0.0008048	0.0009876	0.0012642	0.0016962
0.0023906	0.0035301	0.0054053	0.0083917	0.0127205	0.0178956	0.0222440	0.0239114
0.0227638	0.0203397	0.0181645	0.0169382	0.0167498	0.0173877	0.0184388	0.0193159
0.0194215	0.0184697	0.0166779	0.0145862	0.0127020	0.0113054	0.0104628	0.0101068
0.0100866	0.0101854	0.0101503	0.0097762	0.0090106	0.0079790	0.0068925	0.0059253
0.0051584	0.0045927	0.0041835	0.0038704	0.0035952	0.0033135	0.0030030	0.0026639
0.0023130	0.0019729	0.0016638	0.0013980	0.0011804	0.0010102	0.0008840	0.0007970
0.0007446	0.0007224	0.0007261	0.0007502	0.0007878	0.0008300	0.0008670	0.0008906
0.0008959	0.0008823	0.0008532	0.0008136	0.0007689	0.0007235	0.0006805	0.0006414
0.0006072	0.0005780	0.0005535	0.0005332	0.0005168	0.0005037	0.0004937	0.0004862
0.0004812	0.0004784	0.0004776					
16	0.19092	0.1904560E-01	12345			24	
0.0009699	0.0009756	0.0009876	0.0010054	0.0010298	0.0010618	0.0011033	0.0011565
0.0012247	0.0013126	0.0014270	0.0015777	0.0017794	0.0020537	0.0024334	0.0029676
0.0037285	0.0048174	0.0063623	0.0084902	0.0112504	0.0144847	0.0177173	0.0202306
0.0214062	0.0211039	0.0197138	0.0178585	0.0160617	0.0146125	0.0135974	0.0129813
0.0126702	0.0125468	0.0124895	0.0123875	0.0121566	0.0117512	0.0111704	0.0104540
0.0096693	0.0088933	0.0081948	0.0076212	0.0071924	0.0069009	0.0067165	0.0065946
0.0064854	0.0063447	0.0061413	0.0058609	0.0055056	0.0050898	0.0046351	0.0041656
0.0037041	0.0032700	0.0028776	0.0025363	0.0022501	0.0020188	0.0018384	0.0017026
0.0016037	0.0015331	0.0014828	0.0014452	0.0014143	0.0013855	0.0013559	0.0013245
0.0012909	0.0012558	0.0012202	0.0011851	0.0011513	0.0011194	0.0010900	0.0010633
0.0010393	0.0010182	0.0009999	0.0009843	0.0009714	0.0009611	0.0009534	0.0009483
0.0009456	0.0009455	0.0009470					
17	0.20068	0.1935769E-01	12345			30	
0.0009599	0.0009628	0.0009682	0.0009755	0.0009853	0.0009983	0.0010153	0.0010380
0.0010683	0.0011094	0.0011657	0.0012442	0.0013552	0.0015152	0.0017505	0.0021046
0.0026505	0.0035120	0.0048947	0.0071207	0.0106211	0.0157692	0.0223943	0.0291286
0.0335085	0.0336468	0.0299731	0.0246841	0.0197818	0.0161222	0.0137163	0.0122669
0.0114548	0.0110203	0.0107658	0.0105445	0.0102531	0.0098309	0.0092596	0.0085627
0.0077968	0.0070360	0.0063509	0.0057908	0.0053752	0.0050955	0.0049250	0.0048292
0.0047747	0.0047338	0.0046863	0.0046178	0.0045186	0.0043811	0.0041995	0.0039704
0.0036939	0.0033758	0.0030278	0.0026665	0.0023102	0.0019751	0.0016729	0.0014099
0.0011879	0.0010051	0.0008580	0.0007422	0.0006530	0.0005862	0.0005380	0.0005051
0.0004848	0.0004749	0.0004734	0.0004784	0.0004885	0.0005023	0.0005184	0.0005358
0.0005534	0.0005707	0.0005869	0.0006016	0.0006147	0.0006260	0.0006354	0.0006429
0.0006486	0.0006524	0.0006541					
18	0.21045	0.1416145E-01	12345			30	
0.0008521	0.0008565	0.0008686	0.0008890	0.0009189	0.0009601	0.0010156	0.0010896
0.0011881	0.0013202	0.0014998	0.0017478	0.0020972	0.0026001	0.0033381	0.0044368
0.0060745	0.0084642	0.0117546	0.0158062	0.0199372	0.0229967	0.0240215	0.0229507
0.0205756	0.0178685	0.0154738	0.0136442	0.0123887	0.0116113	0.0111853	0.0109848
0.0109014	0.0108557	0.0108046	0.0107378	0.0106648	0.0105966	0.0105278	0.0104227
0.0102116	0.0098068	0.0091444	0.0082357	0.0071806	0.0061216	0.0051764	0.0044038
0.0038115	0.0033802	0.0030820	0.0028906	0.0027831	0.0027391	0.0027386	0.0027599
0.0027788	0.0027714	0.0027197	0.0026178	0.0024740	0.0023065	0.0021365	0.0019816
0.0018529	0.0017555	0.0016900	0.0016544	0.0016446	0.0016551	0.0016791	0.0017082
0.0017338	0.0017479	0.0017446	0.0017215	0.0016796	0.0016225	0.0015554	0.0014835
0.0014114	0.0013426	0.0012793	0.0012230	0.0011744	0.0011336	0.0011006	0.0010752
0.0010572	0.0010464	0.0010426					
19	0.22021	0.1503753E-01	12345			30	
0.0010019	0.0010065	0.0010172	0.0010338	0.0010575	0.0010899	0.0011336	0.0011922
0.0012709	0.0013775	0.0015237	0.0017274	0.0020171	0.0024387	0.0030677	0.0040285
0.0055206	0.0078378	0.0113199	0.0161058	0.0215919	0.0260330	0.0273649	0.0250810
0.0207097	0.0162161	0.0126738	0.0102819	0.0088670	0.0082093	0.0081469	0.0085733
0.0093949	0.0104749	0.0115850	0.0124083	0.0126311	0.0120932	0.0108854	0.0093004
0.0076791	0.0062734	0.0052020	0.0044787	0.0040626	0.0038923	0.0039003	0.0040143
0.0041585	0.0042617	0.0042715	0.0041651	0.0039515	0.0036621	0.0033376	0.0030164
0.0027268	0.0024862	0.0023022	0.0021759	0.0021052	0.0020865	0.0021161	0.0021904
0.0023054	0.0024558	0.0026328	0.0028236	0.0030099	0.0031694	0.0032797	0.0033241
0.0032960	0.0032012	0.0030551	0.0028776	0.0026877	0.0025003	0.0023254	0.0021684
0.0020313	0.0019142	0.0018159	0.0017347	0.0016688	0.0016165	0.0015765	0.0015474
0.0015285	0.0015191	0.0015177					
20	0.22998	0.1496491E-01	12345			30	
0.0008356	0.0008410	0.0008529	0.0008713	0.0008978	0.0009350	0.0009863	0.0010571
0.0011552	0.0012924	0.0014866	0.0017663	0.0021764	0.0027897	0.0037227	0.0051563
0.0073451	0.0105716	0.0149441	0.0199751	0.0242330	0.0258856	0.0242418	0.0204674
0.0163862	0.0131181	0.0109167	0.0096195	0.0089822	0.0087919	0.0088705	0.0090563

Figure D1. (Sheet 4 of 6)

0.0091973	0.0091689	0.0089068	0.0084313	0.0078396	0.0072682	0.0068500	0.0066896
0.0068584	0.0073846	0.0082082	0.0090969	0.0096115	0.0093005	0.0080808	0.0063591
0.0046841	0.0033754	0.0024805	0.0019171	0.0015863	0.0014155	0.0013616	0.0014056
0.0015461	0.0017958	0.0021796	0.0027282	0.0034651	0.0043793	0.0053887	0.0063190
0.0069417	0.0070787	0.0067053	0.0059586	0.0050474	0.0041509	0.0033720	0.0027450
0.0022629	0.0019023	0.0016368	0.0014435	0.0013040	0.0012047	0.0011354	0.0010886
0.0010585	0.0010409	0.0010325	0.0010306	0.0010332	0.0010386	0.0010454	0.0010526
0.0010595	0.0010653	0.0010689					
21	0.23975	0.1202567E-01	12345			30	
0.0006327	0.0006389	0.0006532	0.0006759	0.0007089	0.0007554	0.0008200	0.0009102
0.0010374	0.0012199	0.0014876	0.0018901	0.0025106	0.0034884	0.0050463	0.0075046
0.0112122	0.0162656	0.0219880	0.0266742	0.0284997	0.0271456	0.0240353	0.0209135
0.0187491	0.0177162	0.0175283	0.0176408	0.0174086	0.0163636	0.0144850	0.0121689
0.0099176	0.0080686	0.0067441	0.0059342	0.0055879	0.0056546	0.0060697	0.0066830
0.0071827	0.0071660	0.0064367	0.0052139	0.0039278	0.0028803	0.0021506	0.0016920
0.0014293	0.0012998	0.0012590	0.0012745	0.0013219	0.0013847	0.0014568	0.0015448
0.0016673	0.0018548	0.0021497	0.0026049	0.0032708	0.0041510	0.0051186	0.0058664
0.0060359	0.0055049	0.0045033	0.0034007	0.0024533	0.0017438	0.0012503	0.0009190
0.0006991	0.0005534	0.0004565	0.0003922	0.0003500	0.0003231	0.0003070	0.0002986
0.0002957	0.0002967	0.0003002	0.0003053	0.0003112	0.0003173	0.0003230	0.0003281
0.0003322	0.0003352	0.0003368					
22	0.24951	0.1091918E-01	12345			30	
0.0010757	0.0010780	0.0010844	0.0010959	0.0011145	0.0011431	0.0011863	0.0012511
0.0013478	0.0014934	0.0017153	0.0020607	0.0026133	0.0035249	0.0050714	0.0077290
0.0121941	0.0190559	0.0276877	0.0350065	0.0369857	0.0329569	0.0262404	0.0202180
0.0161722	0.0140090	0.0132693	0.0134871	0.0141654	0.0147223	0.0146192	0.0136312
0.0119675	0.0100782	0.0083610	0.0070224	0.0061050	0.0055624	0.0053054	0.0052091
0.0051162	0.0048839	0.0044631	0.0039239	0.0033859	0.0029361	0.0026019	0.0023681
0.0021992	0.0020562	0.0019106	0.0017531	0.0015942	0.0014545	0.0013539	0.0013062
0.0013199	0.0013994	0.0015432	0.0017379	0.0019490	0.0021190	0.0021845	0.0021080
0.0019021	0.0016200	0.0013244	0.0010606	0.0008491	0.0006920	0.0005828	0.0005126
0.0004738	0.0004607	0.0004694	0.0004974	0.0005423	0.0006017	0.0006720	0.0007489
0.0008275	0.0009034	0.0009728	0.0010332	0.0010836	0.0011240	0.0011549	0.0011776
0.0011932	0.0012027	0.0012063					
23	0.25928	0.9685772E-02	12345			30	
0.0007947	0.0007981	0.0008089	0.0008284	0.0008588	0.0009040	0.0009698	0.0010653
0.0012047	0.0014112	0.0017227	0.0022039	0.0029653	0.0041946	0.0061939	0.0093861
0.0141684	0.0204266	0.0268362	0.0310119	0.0313831	0.0287982	0.0254623	0.0229696
0.0217427	0.0214079	0.0211782	0.0202291	0.0181951	0.0154111	0.0125773	0.0102408
0.0086021	0.0076189	0.0071442	0.0069752	0.0068424	0.0064483	0.0056444	0.0045943
0.0036402	0.0030152	0.0027660	0.0028454	0.0031600	0.0035258	0.0036497	0.0032994
0.0025552	0.0017468	0.0011308	0.0007565	0.0005662	0.0004988	0.0005243	0.0006439
0.0008796	0.0012536	0.0017429	0.0022334	0.0025459	0.0025596	0.0023091	0.0019364
0.0015744	0.0012905	0.0010975	0.0009827	0.0009269	0.0009108	0.0009151	0.0009212
0.0009134	0.0008827	0.0008290	0.0007594	0.0006838	0.0006109	0.0005464	0.0004928
0.0004502	0.0004178	0.0003940	0.0003772	0.0003658	0.0003585	0.0003542	0.0003518
0.0003507	0.0003502	0.0003501					
24	0.26904	0.9454967E-02	12345			30	
0.0006549	0.0006553	0.0006549	0.0006542	0.0006554	0.0006611	0.0006755	0.0007046
0.0007574	0.0008491	0.0010061	0.0012785	0.0017668	0.0026828	0.0044836	0.0081215
0.0152496	0.0272400	0.0410083	0.0466729	0.0392718	0.0268796	0.0176076	0.0127429
0.0109950	0.0113782	0.0134351	0.0165659	0.0192215	0.0192655	0.0161445	0.0116883
0.0079119	0.0054820	0.0041889	0.0036900	0.0037710	0.0043077	0.0050873	0.0056457
0.0055120	0.0047653	0.0039300	0.0033750	0.0031592	0.0031889	0.0033057	0.0033171
0.0030853	0.0026352	0.0021300	0.0017256	0.0014877	0.0014160	0.0014896	0.0016802
0.0019385	0.0021826	0.0023194	0.0023000	0.0021537	0.0019627	0.0018074	0.0017379
0.0017747	0.0019165	0.0021353	0.0023644	0.0025019	0.0024552	0.0022047	0.0018200
0.0014077	0.0010482	0.0007732	0.0005798	0.0004509	0.0003684	0.0003182	0.0002903
0.0002783	0.0002779	0.0002861	0.0003005	0.0003190	0.0003395	0.0003600	0.0003784
0.0003930	0.0004023	0.0004054					
25	0.27881	0.8910973E-02	12345			30	
0.0024412	0.0024271	0.0023776	0.0022966	0.0021930	0.0020786	0.0019670	0.0018738
0.0018168	0.0018182	0.0019106	0.0021489	0.0026370	0.0035844	0.0054220	0.0089905
0.0156059	0.0260555	0.0373832	0.0418255	0.0357031	0.0251214	0.0166768	0.0118015
0.0095335	0.0089322	0.0095201	0.0110828	0.0133411	0.0155742	0.0165496	0.0153438
0.0124306	0.0092761	0.0069287	0.0055848	0.0050477	0.0050974	0.0055508	0.0061620
0.0065309	0.0062437	0.0052480	0.0039415	0.0027775	0.0019545	0.0014606	0.0012241
0.0011981	0.0013881	0.0018504	0.0026393	0.0036546	0.0044922	0.0046486	0.0040369
0.0030752	0.0022211	0.0016634	0.0013929	0.0013535	0.0015072	0.0018218	0.0022214
0.0025519	0.0026339	0.0023930	0.0019240	0.0014036	0.0009643	0.0006505	0.0004486
0.0003270	0.0002580	0.0002225	0.0002093	0.0002120	0.0002270	0.0002519	0.0002846
0.0003229	0.0003645	0.0004068	0.0004479	0.0004859	0.0005193	0.0005474	0.0005693
0.0005846	0.0005932	0.0005953					

Figure D1. (Sheet 5 of 6)

26	0.28857	0.8448971E-02	12345	30
0.0010571	0.0010534	0.0010436	0.0010293	0.0010134
0.0010308	0.0010977	0.0012223	0.0014404	0.0018164
0.0094061	0.0155273	0.0240366	0.0322804	0.0355763
0.0189090	0.0180070	0.0180122	0.0179407	0.0169521
0.0067682	0.0052477	0.0043760	0.0040080	0.0040368
0.0064654	0.0063530	0.0053986	0.0039787	0.0026532
0.0009523	0.0010833	0.0013433	0.0016797	0.0019991
0.0027792	0.0035002	0.0048054	0.0065787	0.0079965
0.0023967	0.0014029	0.0008761	0.0006136	0.0004938
0.0006205	0.0007283	0.0008370	0.0009285	0.0009903
0.0009926	0.0009761	0.0009646	0.0009591	0.0009588
0.0009757	0.0009762	0.0009743		
27	0.29834	0.8193422E-02	12345	30
0.0013036	0.0012931	0.0012679	0.0012311	0.0011858
0.0010255	0.0010314	0.0010839	0.0012132	0.0014781
0.0103011	0.0205606	0.0370198	0.0504675	0.0467305
0.0090844	0.0085019	0.0091578	0.0105202	0.0119343
0.0087410	0.0072013	0.0060134	0.0050844	0.0043363
0.0044016	0.0052117	0.0056390	0.0050878	0.0037405
0.0013932	0.0018910	0.0028084	0.0039091	0.0046157
0.0043794	0.0053678	0.0065233	0.0067571	0.0054403
0.0006645	0.0005227	0.0005214	0.0006359	0.0008811
0.0023402	0.0021939	0.0018551	0.0014892	0.0011934
0.0007772	0.0007824	0.0008071	0.0008441	0.0008873
0.0010316	0.0010447	0.0010466		
28	0.30811	0.8089246E-02	12345	30
0.0016637	0.0016639	0.0016632	0.0016624	0.0016643
0.0018218	0.0019635	0.0022000	0.0025895	0.0032327
0.0143431	0.0219684	0.0310663	0.0379053	0.0385715
0.0166292	0.0130074	0.0100221	0.0076454	0.0059408
0.0065195	0.0084810	0.0098482	0.0092910	0.0073265
0.0059355	0.0066137	0.0060688	0.0044628	0.0029313
0.0026961	0.0034911	0.0039279	0.0037250	0.0032173
0.0038600	0.0042305	0.0039809	0.0031915	0.0023527
0.0017759	0.0020029	0.0021303	0.0020551	0.0017983
0.0008078	0.0007114	0.0006501	0.0006108	0.0005847
0.0005429	0.0005437	0.0005487	0.0005572	0.0005685
0.0006153	0.0006210	0.0006225		
29	0.31787	0.8692119E-02	12345	30
0.0011941	0.0011884	0.0011661	0.0011290	0.0010818
0.0009471	0.0009840	0.0010904	0.0013151	0.0017557
0.0138028	0.0228236	0.0313301	0.0337381	0.0296839
0.0190578	0.0173710	0.0138204	0.0096016	0.0062463
0.0047760	0.0076438	0.0120334	0.0153910	0.0147644
0.0042792	0.0034424	0.0030505	0.0030616	0.0034335
0.0027585	0.0019827	0.0016386	0.0017100	0.0021322
0.0023424	0.0019038	0.0018355	0.0023048	0.0035347
0.0046448	0.0032021	0.0024054	0.0021074	0.0021134
0.0022032	0.0018501	0.0014632	0.0011286	0.0008800
0.0005595	0.0005809	0.0006266	0.0006911	0.0007682
0.0010637	0.0011011	0.0011145		

Figure D1. (Sheet 6 of 6)

# Appendix E

## Notation

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Text      Appendix C

<i>asc</i>		Mnemonic indicating that an output data file is in ASCII format
	<i>datetime</i>	Ten-character string that contains date and time
<i>dd</i>		Two-digit code for day
	<i>dber</i>	Mean water depth
	<i>dmax</i>	Maximum segment-averaged water depth in a collection
	<i>dmin</i>	Minimum segment-averaged water depth in a collection
<i>df</i>	<i>delfs</i>	Frequency increment
	<i>d6b</i>	Vector averaged mean wind direction at building anemometer
	<i>d6s</i>	Measure of variability of wind direction at building anemometer
	<i>d9b</i>	Vector averaged mean wind direction at pier-end anemometer
	<i>d9s</i>	Measure of variability of wind direction at pier-end anemometer
<i>dθ</i>	<i>odelang</i>	Direction increment

Text      Appendix C

$D(f_n, \theta_m)$		Directional distribution function at frequency $f_n$ and direction $\theta_m$
$E_i$		Incident wave energy
$E_r$		Reflected wave energy
$fd$		Mnemonic denoting frequency-direction to distinguish a type of output data file
$f_n$		$n^{th}$ frequency of a set of $N$ discrete frequencies
$f_p$		Peak frequency
	fp	Frequency at peak of frequency spectrum
$f_{p,FD}$		Frequency at peak of frequency-direction spectrum
$f_{p,IFS}$		Frequency at peak of integrated frequency spectrum
$hh$		Two-digit code for hour
$hhmm$		Four-digit code for time of day using $hh$ for hour and $mm$ for minute
$H_{mo}$	Hmo	Characteristic wave height
$H_{mo,i}$		Characteristic incident wave height
$H_{mo,r}$		Characteristic reflected wave height
	idgfr	Degrees of freedom in cross-spectral estimation
	ifdtrnd	Flag indicating whether or not data have been detrended
	ifimle	Flag indicating if maximum likelihood or iterative maximum likelihood estimation is used
	ifwindo	Flag indicating whether or not data segments have been windowed

**Text      Appendix C**

	<b>istot</b>	Total number of seconds duration of a time series
	<b>itero(nof)</b>	Number of iterative maximum likelihood iterations used to compute directional distribution at frequency of(nof)
<b><math>I(f_n, \theta_j)</math></b>		Cumulative distribution function at frequency $f_n$ and direction $\theta_m$
<b><math>j</math></b>		Index associated with discrete direction
<b><math>la</math></b>		Mnemonic denoting linear array to distinguish a type of output data file
<b><math>m</math></b>	<b>noe</b>	Index associated with discrete direction
<b><math>M</math></b>	<b>noang</b>	Integer number of discrete directions
<b><math>mm</math></b>		Two-digit code for month or minute as dictated by context
<b><math>n</math></b>	<b>nof</b>	Index associated with discrete frequency
	<b>nband</b>	Number of frequency bands averaged in spectral estimation
	<b>nensb</b>	Number of segments into which a data record is divided during spectral estimation
	<b>nfft</b>	Number of data points in a data segment
<b><math>N</math></b>	<b>nofrq</b>	Integer number of discrete frequencies
	<b>oangle(noe)</b>	Element noe of an array that represents direction coordinates
	<b>of(nof)</b>	Element nof of an array that represents frequency
	<b>ogpat(nof)</b>	Element nof of an array of sixteen-character strings that represent the working gauge pattern
	<b>osf(nof)</b>	Element nof of an array that represents the frequency spectrum



**Text      Appendix C**

$oapc(nof, noe)$	Array element representing the directional distribution function at frequency $of(nof)$ and direction $oangle(noe)$
$rname$	Four-character string denoting reference gauge
$sfrq$	Sampling frequency
$s6b$	Mean wind speed at building anemometer
$s6m$	Maximum wind speed at building anemometer
$s6s$	Standard deviation of wind speed at building anemometer
$s9b$	Mean wind speed at pier-end anemometer
$s9m$	Maximum wind speed at pier-end anemometer
$s9s$	Standard deviation of wind speed at pier-end anemometer
$S(f)$	Frequency spectrum
$S(f_n)$	Integrated frequency spectral density at frequency $f_n$
$S(\theta_m)$	Integrated direction spectral density at direction $\theta_m$
$S(f_n, \theta_m)$	Frequency-direction spectral density at frequency $f_n$ and direction $\theta_m$
$S_{min}(f_n)$	Minimum of $S(f_n, \theta_m)$ at frequency $f_n$
$thp$	Peak direction of directional distribution at frequency $f_p$
$T_p$	Spectral peak period
$T_{p,FD}$	Spectral peak period from the frequency at which the frequency-direction spectrum is a maximum

<u>Text</u>	<u>Appendix C</u>
$T_{p,fs}$	Peak period from the integrated frequency spectrum
$w_m$	$m^{\text{th}}$ of a set of $M$ weights used in the computation of incident and reflected energy
$yy$	Two-digit code for year
$yyymmdd$	Six-digit code for date using $yy$ for year, $mm$ for month, and $dd$ for day
$\Delta\theta$	Directional spread parameter
$\Delta\theta_n$	Directional spread parameter of a 180-deg directional distribution at frequency $f_n$
$\Delta\theta_{FDp}$	Directional spread parameter of the directional distribution at the peak frequency of a frequency-direction spectrum
$\Delta\theta_{DS}$	Directional spread parameter of integrated direction spectrum
$\Delta\theta_{SW}$	Spectrally weighted directional spread parameter
$\theta_j$	$j^{\text{th}}$ direction of a set of $M$ discrete directions
$\theta_m$	$m^{\text{th}}$ direction of a set of $M$ discrete directions
$\theta_p$	Peak direction
$\theta_{p,n}$	Direction of peak in directional distribution function at frequency $f_n$
$\theta_{p,FD}$	Direction at peak of frequency-direction spectrum
$\theta_{p,DS}$	Direction at peak of integrated direction spectrum
$\theta_{p,SW}$	Spectrally weighted peak direction

**Text**      **Appendix C**

$\theta_{25\%,n}$	Direction at which cumulative distribution function equals 0.25 at frequency $f_n$
$\theta_{50\%,n}$	Direction at which cumulative distribution function equals 0.50 at frequency $f_n$
$\theta_{75\%,n}$	Direction at which cumulative distribution function equals 0.75 at frequency $f_n$
$\chi$	Reflection coefficient

# REPORT DOCUMENTATION PAGE

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